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ABSTRACT

This document presents elements of a symposium developed by the Alverno College, Wisconsin, research and evaluation staff on the extent to which educational research that is internally driven by institutionally defined purposes and questions is valid and useful to the educational research community as a way of addressing its larger questions about learning and teaching. The document contains outlines and discussions of symposium questions, symposium objectives potential beneficiaries from advances on the questions posed by the symposium, questions posed for Alverno College, lessons learned and unresolved issues. Also included are five research examples from Alverno College's research and evaluation department. Those examples are: a longitudinal analysis of cognitive, moral and ego development trajectories; an analysis of self-sustained learning and development; a study of career trajectories of women; research toward a taxonomy of alumnae generic and professional abilities; and an evaluation of professional abilities and student outcomes. Appendixes contain a description of the current student body at Alverno, a description of the longitudinal sample, charts of educational and developmental stages and relationships, a summary of statistics, a summary of generic abilities, an example of coding analysis of an essay, and 114 references. (JB)

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UNDERSTANDING ABILITIES, LEARNING AND DEVELOPMENT THROUGH COLLEGE OUTCOMES STUDIES:
WHAT CAN WE EXPECT FROM HIGHER EDUCATION ASSESSMENT?

Marcia Mentkowski, Glen Rogers, Deborah Deemer, Tamar Ben-Ur,
Judy Reisetter, William Rickards, Mary Talbott

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Office of Research and Evaluation
Alverno College
Milwaukee, Wisconsin

Symposium presented at the Annual
Meeting of the American Educational
Research Association, Chicago
April 5, 1991

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UNDERSTANDING ABILITIES, LEARNING AND DEVELOPMENT THROUGH COLLEGE OUTCOMES STUDIES:

WHAT CAN WE EXPECT FROM HIGHER EDUCATION ASSESSMENT?[1]

Marcia Mentkowski, Glen Rogers, Deborah Deemer, Tamar Ben-Ur

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Office of Research and Evaluation
ALVERNO COLLEGE

This symposium examines the extent to which educational research that is internally driven, by institutionally defined purposes and questions, is valid and useful to the educational research community, as a way of addressing larger questions about teaching and learning.

Recent state mandates for higher education assessment have generated a spate of studies within colleges and universities designed to collect information on college outcomes.

What can we expect from these studies in higher education assessment? As educational researchers invested in our discipline or as institutional representatives doing assessment, we expect that assessment -- carried out by and for an institution -- will improve educational practice and student learning.

But to what degree will we realize these expectations? The assessment movement currently is concerned with one aspect of this question, "To what degree can assessment benefit the institution that initiates it?" This question is of primary importance to those of us doing assessment because many of us are not satisfied what has been going on in the name of assessment. In Assessment for Excellence, Astin (1991) argues that "although a great deal of assessment activity goes on in America's colleges and universities, much of it is of very little benefit to either students, faculty, administrators, or institutions (p. ix)". Nevertheless, developing assessment practice designed for a particular institution's purposes to enhance educational benefits is clearly an important goal (Mentkowski, in press).

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[1] Symposium presented at the American Educational Research Association, Chicago, April 5, 1991. The authors acknowledge Joan Stark, University of Michigan, and Jon Wergin, Virginia Commonwealth University, for their role in this Division J (Postsecondary Education) symposium, and for their review and critique of this paper. Stark, who is Director of the National Center for Research to Improve Postsecondary Teaching and Learning, set the context for the symposium and served as discussant. Wergin, who is Vice President of Division I (Education in the Professions) and a member of the Alverno Research and Evaluation Advisory Council, also served as discussant. Alverno's Research and Evaluation Committee critiqued this paper: members are Zita Allen, Lucy Cromwell, Mary Diez, Austin Doherty, Georgine Loacker, Kathleen O'Brien, Timothy Riordan and Stephen Sharkey. Kathleen Schwan, Beverly Weeden, Lynn Chabot-Long and Rene Sisouphone contributed to the production of the paper.

Therefore, educational researchers doing assessment are asking (see Figure 1):

(1) To what degree do college outcomes studies contribute to an institution's purposes?

Today's discussion will deal indirectly with this question, as it is incorporated in the first objective of this symposium. Today's discussion is designed to enable the AERA Division J membership to begin exploring this objective:

(a) To discuss how AERA's Division J can best provide a forum and critique for such studies so as to influence the direction and quality of higher education assessment as an emerging field.

The presenters at this table believe AERA can and does provide an excellent forum for this discussion. (In fact, Alverno faculty and research staff made 19 presentations at AERA from 1980 to 1990.) It is our practice to invite critique along the way, as we are designing and implementing various research and evaluation strategies, and after sets of results are in and interpretations made. Clearly, our research and evaluation team is a primary beneficiary from today's critique, as are other institutions and their representatives who have similar concerns (see Figure 1).

But what should be the nature of the critique? What criteria should such studies aim to meet? By what evidence should such studies be judged? What are the standards to which such studies should be held? Because we, as AERA-J members, are concerned with these questions, we are invested parties in today's critique.

Because the higher education assessment movement has created a new context for conducting educational research, there is a leadership role for AERA-J in ensuring the quality of higher education assessment. Many educational psychologists are involved in carrying out college outcomes studies in their own institutions. These studies represent a new source of hard money funding for educational research, badly in need of research dollars.

However, such studies can potentially make other contributions in addition to examining an individual institution's quality, effectiveness, and validity. For educational psychologists, it seems unwise to overlook higher education assessment as a source for contributions to the philosophy, principles and practice of educational research.

Consequently, we ask:

(2) To what degree can college outcomes studies yield new knowledge re research/evaluation/measurement methods and practice, and illuminate its philosophical assumptions and values?

A corresponding symposium objective is:

(b) to critique the value of diverse methods for contributions to educational research philosophy/principles/practice;

1991 AERA SYMPOSIUM April 5, 1991

Figure 1. **Symposium questions, objectives and potential beneficiaries.**

Symposium Questions	Objectives	Potential Beneficiaries
1. To what degree can college outcomes studies contribute to an institution's purposes?	a. To discuss how AERA's Division J can best provide a forum and critique for such studies so as to influence the direction and quality of higher education assessment as an emerging field.	• Institutions and their representatives engaged in institutional assessment. • AERA Division J membership. • Alverno research and evaluation team/committee.
2. To what degree can college outcomes studies contribute new knowledge to educational research/evaluation/ measurement methods and practice, and illuminate its philosophical assumptions and values?	b. To critique the value of diverse methods for contributions to educational research philosophy/ principles/practice.	• Alverno research and evaluation team/committee. • Educational researchers developing the field of educational research. • Teachers, students and other practitioners of educational research.
3. To what degree can college outcomes studies contribute new knowledge to discipline-based theories and methods in student/adult development, learning and abilities, which can form a partial base for undergraduate educational practice?	c. To critique the value of diverse methods and results for building discipline-based theory/method.	• Alverno research and evaluation team/committee; Alverno faculty and staff. • Teachers and other advisors of college students. • Scholars in college student/ adult development, learning and abilities.
4. How can college outcomes studies simultaneously contribute to a particular institution's purposes and to the more general purposes of educational research and post-secondary practice?	d. To identify issues that studies conducted for purposes of institutional assessment will need to resolve and criteria studies will need to meet in order to contribute to postsecondary research and practice beyond a particular institution.	• Alverno research and evaluation philosophy, principles and practice; Alverno frameworks: Educational philosophy, principles and practice. • Educational research community interested in improving the quality of its discipline and benefits of its profession for its higher education constituencies. • Institutions and their representatives interested in advancing higher education through institutional assessment and other forms of institutional scholarship and development.

a:\AERA GRAPHICS\figure1.mm\wp51,lynn\4-1-91

Potential beneficiaries of these contributions could include educational research colleagues who are engaged in similar purposes as the Alverno team, but more broadly, educational researchers who are developing the field itself, and teachers, students and other practitioners of educational research.

It is also important to ask whether college outcomes studies can contribute to our general understanding of student/adult development, learning and abilities. Can higher education assessment studies contribute to one of the key knowledge bases for educational practice?

Consequently, we ask:

(3) To what degree can college outcomes studies contribute new knowledge to discipline-based theories and methods in student/adult development, learning and abilities, which can form a partial base for undergraduate educational practice?

Alverno researchers think college outcomes studies can make such a contribution, provided an institution has the development of student abilities, learning and personal growth as part of its mission. We are asking AERA-J to critique this assumption.

Thus, a corresponding symposium objective is:

(c) to critique the value of diverse methods and results for building discipline-based theory/method.

Potential beneficiaries of these contributions could include those of us who are directly or indirectly involved in improving practice, because we are teachers or other advisors of college students. Benefits will be more likely for those of us who are educating a diverse population of traditional and nontraditional age women, a population Alverno serves. Large numbers of these women have recently entered higher education. Another audience for these contributions consists of scholars who are engaged in research in human development, learning, and abilities.

Today's symposium will test the second question about contribution to educational research methods and the third question about contribution to discipline-based theory and methods through a discussion of diverse methods and results from a coherent approach to higher education institutional assessment that has been in place 15 years, and through an examination of five examples from complete and ongoing studies.

In this emerging educational research mode, purposes, goals and methods for institutional assessment need to be coherent with those of a particular context. Does the primary emphasis on internal purposes and use of findings at a particular institution limit the benefit for external audiences? How might internal and external uses of information complement each other? This leads to a fourth question, which is our overall symposium theme:

(4) How can college outcomes studies contribute to a particular institution's purposes and simultaneously contribute to the more general purposes of educational research and postsecondary practice?

Which criteria should such studies meet to maximize broader benefits for educational research and postsecondary practice? How do we define "contribute to internal institutional purposes?" How do we define "contribute to more general purposes?" These questions are incorporated in our final, and most important symposium objective, which is:

(d) to identify issues that studies conducted for purposes of institutional assessment will need to resolve and criteria studies will need to meet in order to contribute to postsecondary research and practice beyond a particular institution.

Who will benefit from the critique implied in this objective? Institutions and their representatives engaged in institutional assessment, and the AERA Division J membership will benefit (see Figure 1).

The two discussants who will provide a response have qualifications that are particularly suited to such critique. They do provide different viewpoints. But more important, they can speak to two critical audiences for this symposium. The first audience is the educational research community interested in improving the quality of its discipline and benefits of its profession for its higher education constituencies. The chair and discussant, Joan Stark, responds out of her experience as Director of NCRIPTAL, a research center designed to meet a wide range of institutions' purposes. She is experienced in carrying out the purposes of a national center for research to improve postsecondary teaching and learning, which was charged with contributing research that could benefit educational practice in general. She can also take the perspective of ASHE, as she is a former president of that higher education organization.

The other discussant addresses another critical audience for this symposium: institutions and their representatives interested in advancing higher education through institutional assessment and other forms of institutional scholarship and development. Jon Wergin was an NCRIPTAL evaluator, and has had to ask about contributions of research centers to teaching and learning practice. He is also directly involved in institutional assessment efforts. Thus, he is experienced in seeing the issues from the outside and the inside of an institution and can take an institutional perspective. He can also take the perspective of a current AERA Vice President. Jon Wergin is also a member of Alverno's Research and Evaluation Advisory Council, composed of individuals who from time to time, provide critique for the College's research and evaluation purposes and activities.

Alverno research and evaluation, philosophy, principles and practices will also benefit. (Alverno's Office of Research and Evaluation organized this AERA symposium as the fourth in a series of presentations dealing with this topic: AAHE Assessment Forum and the American Evaluation Association (Mentkowski, 1989), and the American Psychological Association (Mentkowski, 1990)). Inviting such critique and making these contributions is an explicit component of the College's mission (Alverno College, 1986). Our view of ourselves as professionals demands such critique and contribution. Thus, it is an explicit goal of the Office of Research and Evaluation to elicit constructive critique and to contribute to higher education research and evaluation. In turn, we expect to contribute to creating more generalizable models of adult abilities, learning and development (see Figure 2). We work to contribute to emerging pictures of human potential, pictures of what it is possible for students to become. These pictures function as sources for goal setting, instructional strategies and assessment criteria for a student-centered institution.

The Office of Research and Evaluation has been in place long enough (15 years) to enable us to review results from long-term and ongoing studies. The research team also has experience with a diversity of methods and theoretical frameworks.2

One might argue that reviews like today's are essential as a starting point into the topic of this symposium: What can we expect from higher education assessment? Other educational researchers involved in other higher education assessment programs such as the University of Tennessee-Knoxville, Northeast Missouri State University, Kean College, or Clayton State College could also offer a systematic review of their institution's research results in the context of today's questions. James Madison University, Miami University of Ohio, Millsaps College and CEGEP (Colleges d'enseignement general et professionnel) in Montreal (Bateman, 1990) are candidates for such a review related to the topic of student/adult learning, development and abilities.

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2 While the presenters are working at the same institution and are part of a research and evaluation team, they represent the disciplines of educational psychology, developmental psychology, social psychology, sociology, evaluation and higher education administration. They were schooled in different theoretical frameworks and methods at seven different Universities (University of Wisconsin - Madison; University of Kentucky; University of Minnesota; University of Illinois; University of Arizona; Iowa State University; and the University of Wisconsin - Milwaukee). The studies they will present today represent diverse theory and methods. This inter-disciplinary team works to ensure that any one study, even though it is grounded in a particular theory or method, has the benefit of the thinking of researchers from the other disciplines represented on the team. The research team consults with faculty in other disciplines in the institution through committees that meet for this and other purposes.)

Figure 2. Alverno mission and Office of Research and Evaluation goals.

Alverno Mission	Office of Research and Evaluation Goals
Alverno's mission is the personal and professional development of women through education. This goal describes both our long-term and our daily pursuits, and we regard four activities as essential to both.	
Creating a Curriculum: We organize learning so that it develops students' abilities, builds on a liberal arts foundation, is rooted in the Catholic tradition, accommodates the diverse needs of women, and is affordable for women of varied economic circumstances.	Initiate and maintain research and evaluation as a concept and function at Alverno. Research and evaluate the quality, effectiveness and validity of the learning process.
Creating a Community of Learning: The common purposes that gathers Alverno faculty, staff, students and supporters is the pursuit of knowledge and development of students' abilities.	Contribute to creating more generalizable models of adult abilities, learning and development. Contribute to program, student and faculty development. Collaborate in ensuring the quality of various research and evaluation activities within the college.
Creating Ties to the Community: Learning requires relationships with business, industry and community institutions so that students prepare effectively to enter or continue in the world of work and fulfill the responsibilities of citizenship and service.	Establish Alverno as an accountable educational institution in the local/professional community.
Creating Relationships with Higher Education: Faculty and staff elicit from colleagues constructive criticism of their teaching, scholarship and research on teaching and learning. In this way, they hold themselves responsible for a continuing contribution to the advancement of undergraduate education.	Elicit constructive critique from colleagues, and establish Alverno as a contributor to higher education research and evaluation.

There are other strategies for asking these questions that can also provide a test of the benefits to postsecondary research and practice from institutional assessment. The literature review is a case in point. Indeed, Pascarella and Terenzini's (1991) recent analysis may provide a jumping off point for setting context, because they review college outcomes studies. We would, of course, have to separate out those studies conducted for purposes other than institutional assessment in our critique. As the assessment literature expands, this will become an important activity. Indeed, John Heywood's 1989 book on higher education assessment, Peter Ewell's 1984 book on self-regarding institutions, Ewell's 1985 book on assessing educational outcomes and his recent article (1991), are four such reviews (Alverno's institutional assessment efforts and those of other institutions are discussed in each of these sources.)

In sum, the presenters' examples, and the discussants' critique, can open the issues before us: What can educational research expect from higher education assessment? What can discipline-based theory and method in adult development, learning and abilities expect? How can AERA's Division J best influence the direction and quality of higher education assessment as an emerging field and what criteria should be met? Ultimately, what are the issues that need to be resolved in order for institutional assessment studies to contribute to postsecondary practice beyond a particular institution? This symposium examines the extent to which educational research that is internally driven, by institutionally defined purposes and questions, is valid and useful to the educational research community, as a way of addressing larger questions about teaching and learning.

Let us now move to Figure 1a (an extended version of Figure 1) which is inserted in its fuller form once again at this point. This column "translates" each of the symposium questions into an "Alverno" question, since we are presenting today. Clearly, other institutions may ask their own questions in this column, and might ask them quite differently, given their own purposes and college outcomes studies.

Insert the legal size expanded version of Figure 1 on this page

UNDERSTANDING ABILITIES, LEARNING AND DEVELOPMENT THROUGH COLLEGE OUTCOMES STUDIES: WHAT CAN WE EXPECT FROM HIGHER EDUCATION ASSESSMENT? [1]

Symposium Questions	Objectives	Potential Beneficiaries	Corresponding Alverno Questions	Lessons Learned	Unresolved Issues	Which Criteria Apply?
1. To what degree can college outcomes studies contribute to an institution's purposes?	a. To discuss how AERA's Division J can best provide a forum and critique for such studies so as to influence the direction and quality of higher education assessment as an emerging field.	• Institutions and their representatives engaged in institutional assessment. • AERA Division J membership. • Alverno research and evaluation team/committee.	• Do Alverno frameworks contribute to a general philosophy/principles/practices of undergraduate education? (1A) • Do Alverno research and evaluation efforts contribute to institutional purposes, and so support the contribution of Alverno frameworks to general undergraduate education? (1B) • How should Alverno do institutional assessment? (1C)			
Major Theme How can college alumnae outcomes studies simultaneously contribute to a particular institution's purposes and to the more general purposes of educational research and postsecondary practice?	To identify issues that studies conducted for purposes of institutional assessment will need to resolve and criteria studies will need to meet in order to contribute to postsecondary research and practice beyond particular institution.	• Alverno research and evaluation philosophy, principles and practice; Alverno frameworks: Educational philosophy, principles and practice. • Educational research community interested in improving the quality of its discipline and benefits of its profession for its higher education constituencies. • Institutions and their representatives interested in advancing higher education through institutional assessment and other forms of institutional scholarship and development.	• How can Alverno college outcomes studies simultaneously contribute to an institution's purposes and to the more general purposes of educational research and postsecondary practice?	• Contextually valid findings contribute to general theory and practice when they link practice-based frameworks with discipline-based theory in a dynamic setting. • Interdisciplinary research teams apply criteria from various theories and methods, for various purposes. This creates paradoxes.	• What are principles of action and applied research that is problem-driven and practice based? • What are principles of institutional assessment that is also interactive, interdisciplinary, integrative, and intends simultaneous internal and external contributions? • Which criteria apply? How will these shape institutional assessment?	• Coherence/diversity among purposes, designs, methods • Utilization/generalizability of methods, results • Validity/reliability of measurement • Rigor/feasibility of method

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[1] M. Mentkowski, G. Rogers, D. Deemer, T. Ben-Ur, J. Reisetter, W. Rickards, M. Talbott. Symposium presented at the American Educational Research Association, Chicago, April 5, 1991.

Symposium Questions	Objectives	Potential Beneficiaries	Corresponding Alverno Questions	Five Alverno Examples	Lessons Learned	Unresolved Issues
2. To what degree can college outcomes studies contribute new knowledge to educational research/ evaluation/measurement methods and practice, and illuminate its philosophical assumptions and values?	b. To critique the value of diverse methods for contributions to educational research philosophy/ principles/practice.	• Alverno research and evaluation team/ committee. • Educational researchers developing the field of educational research. • Teachers, students and other practitioners of educational research.	• Do Alverno educational research and evaluation frameworks(philosophy/ principles/practice) contribute to general principles for educational research and evaluation practice?	• Longitudinal analysis of change as a result of curriculum (qualitative, quantitative) (I, II, III) • Analysis of professional /alumnae abilities (IV/V) • Evaluation of general education and the major field (V)	• Multiple frameworks and methods yield a useful, complex picture of college outcomes. • An institution's educational frameworks shape a conceptual base for assessment. • Contributions to methods can occur when educational purposes and research methods are inseparable.	• How achieve long- and short-term benefits simultaneously? • How will different conceptual bases for assessment impact college outcomes studies? • What institutional processes link purpose and method? How does method change as a result?
3. To what degree can college outcomes studies contribute new knowledge to discipline-based theories and methods in student/ adult development, learning and abilities, which can form a partial base for undergraduate educational practice?	c. To critique the value of diverse methods and results for building discipline-based theory/method.	• Alverno research and evaluation team/ committee; Alverno faculty and staff. • Teachers and other advisors of college students. • Scholars in college student/adult development, learning and abilities.	• What broad patterns describe development during college and afterwards, and how are these patterns related to curriculum?	• Cognitive, moral and ego development trajectories (I)	• Developmental trajectories differ across domains and timeframes.	• Who changes and why? What are best methods for analyzing intra- and inter-individual change patterns?
			• What learning outcomes describe development, and what curricular elements cause it from the student's perspective?	• Self-sustained learning and development (II)	• Knowledge and performance are linked in student constructions and attributed to curricular elements; understanding criteria leads to self-sustained learning.	• What student perspectives and curricular elements relate to gains in cognitive, moral and ego development?
			• Do women graduates realize their goals?	• Career trajectories of women (III)	• Older and younger women achieve management and professional positions after college.	• What alumnae measures consider the intersection of personal and professional, public and private contributions?
			• How do graduates perform in personal and professional domains?	• Alumnae generic abilities (IV)	• Some generic abilities distinguish effective alumnae performance.	• How well do generic ability codes cross a wide range of personal and professional activities?
			• How do abilities derived from studies of outstanding professionals link to evaluation of student outcomes in the major field?	• Professional abilities and student outcomes (V)	• Curriculum development is informed by a dynamic relationship among coherent, diverse research and evaluation strategies.	• How does personal development interact with disciplinary outcomes? What form does personal and professional integration take?

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SYMPOSIUM QUESTION ONE: TO WHAT DEGREE CAN COLLEGE OUTCOMES STUDIES CONTRIBUTE TO AN INSTITUTION'S PURPOSES?

Alverno Question 1 A, B and C:

Question 1 A: Do Alverno Frameworks (Educational Philosophy/Principles/Practice) Contribute to a General Philosophy/Principles/Practice for Undergraduate Education?

Question 1 B: Do Alverno Research and Evaluation Efforts Contribute to Institutional Purposes, and so Support the Contribution of Alverno Frameworks to General Undergraduate Education?

Question 1 C: How Should Alverno Do Institutional Assessment?

The first section described the symposium questions and objectives, and why the participants organized the symposium. In the next paragraphs, we first show that it is part of Alverno's mission and the Office of Research and Evaluation goals to examine whether Alverno frameworks contribute, and college outcomes studies support this larger contribution. Then we outline a series of questions that are often posed to Alverno by external audiences, as they question the potential of Alverno frameworks to contribute outside the institution. Finally, we cite several references for those persons interested in how Alverno does institutional assessment. We also refer the reader to our thinking on how we should do it (Mentkowski, 1989; 1990). We close with a recap on the symposium questions.

Now we turn to the potential contributions inherent in the symposium questions and objectives as these are diagrammed in Figure 3. Figure 3 is a sort of map of the relationships we are discussing in the symposium.

- o Alverno contributions to general undergraduate education (Question 1 A) and Alverno's research and evaluation efforts, as they contribute to institutional purposes, and so support this larger contribution (Question 1 B);
- o Contributions of Alverno's research and evaluation frameworks to general research and evaluation philosophy, principles and practice (Question 2);
- o Contributions to Alverno's research and evaluation methods and results to discipline-based theory and results (Question 3); and
- o Contributions that simultaneously meet internal and external needs and expectations (Question 4).

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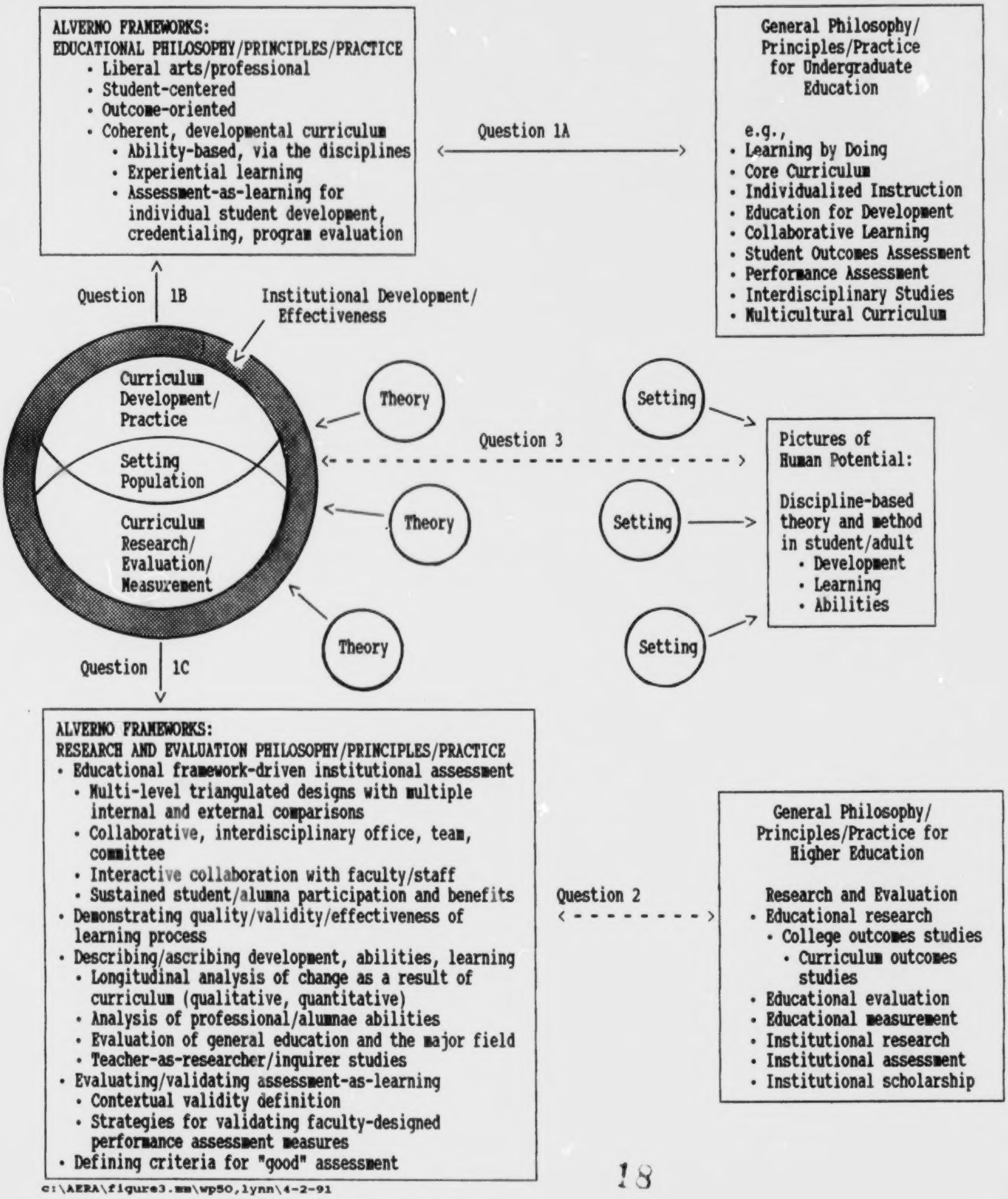
Figure 3. Potential contributions of Alverno research and evaluation Methods/results to research/evaluation/measurement practice, and discipline-based theory/method in student/adult development, learning and abilities.



Question 1A
Question 1B
Question 1C
Question 2
Question 3
Institutional Development/ Effectiveness
Curriculum Development/ Practice
Setting Population
Curriculum Research/ Evaluation/ Measurement
Theory
Theory
Theory
Setting
Setting
Setting

ALVERNO FRAMEWORKS:
EDUCATIONAL PHILOSOPHY/PRINCIPLES/PRACTICE
- Liberal arts/professional
- Student-centered
- Outcome-oriented
- Coherent, developmental curriculum
  - Ability-based, via the disciplines
  - Experiential learning
  - Assessment-as-learning for individual student development, credentialing, program evaluation

General Philosophy/
Principles/Practice
for Undergraduate
Education

e.g.,
- Learning by Doing
- Core Curriculum
- Individualized Instruction
- Education for Development
- Collaborative Learning
- Student Outcomes Assessment
- Performance Assessment
- Interdisciplinary Studies
- Multicultural Curriculum

Pictures of
Human Potential:

Discipline-based theory and method in student/adult
- Development
- Learning
- Abilities

ALVERNO FRAMEWORKS:
RESEARCH AND EVALUATION PHILOSOPHY/PRINCIPLES/PRACTICE
- Educational framework-driven institutional assessment
  - Multi-level triangulated designs with multiple internal and external comparisons
  - Collaborative, interdisciplinary office, team, committee
  - Interactive collaboration with faculty/staff
  - Sustained student/alumna participation and benefits
- Demonstrating quality/validity/effectiveness of learning process
- Describing/ascribing development, abilities, learning
  - Longitudinal analysis of change as a result of curriculum (qualitative, quantitative)
  - Analysis of professional/alumnae abilities
  - Evaluation of general education and the major field
  - Teacher-as-researcher/inquirer studies
- Evaluating/validating assessment-as-learning
  - Contextual validity definition
  - Strategies for validating faculty-designed performance assessment measures
- Defining criteria for "good" assessment

General Philosophy/
Principles/Practice for
Higher Education

Research and Evaluation
- Educational research
  - College outcomes studies
    - Curriculum outcomes studies
- Educational evaluation
- Educational measurement
- Institutional research
- Institutional assessment
- Institutional scholarship

Figure 3 shows these potential contributions. Question 1 A asks whether Alverno educational frameworks contribute to general undergraduate educational philosophy, principles and practices, and whether Alverno's institutional assessment program meets Alverno's purposes (Question 1 B), and so undergirds this contribution. Does Alverno research and evaluation that tests, investigates, and examines Alverno's philosophy, principles and practice contribute to the credibility, effectiveness and validity of Alverno's frameworks in the arena of undergraduate education? We say yes, because we conduct these activities, in part, through comparisons with external theoretical frameworks.

We stated earlier that it is part of Alverno's mission and the Office of Research and Evaluation goals is to show that such contributions are occurring. We now turn to a more explicit discussion of this point for the reader who may be interested in Alverno's mission and the kinds of evidence that can be cited to show that Alverno has made some progress toward the elements of that mission relevant to today's symposium.

Alverno's Mission

One component of Alverno's mission is to elicit constructive critique, and to contribute to the advancement of undergraduate education (see Figure 2).

> Creating relationships with Higher Education: Faculty and staff elicit from colleagues constructive criticism of their teaching, scholarship and research on teaching and learning. In this way, they hold themselves responsible for a continuing contribution to the advancement of undergraduate education (Alverno College, 1986, Chapter 1, pp. 4-5).

Consequently, one goal of the Office of Research and Evaluation is to elicit constructive criticism from colleagues and to establish Alverno as a contributor to higher education research and evaluation in order to support this broader institutional goal.

The number of citations in the literature, collaborations, and consultations with other institutions suggest some progress toward this broad institutional goal. For example, since 1973, there have been a total of 2,796 individuals from 894 institutions who have visited Alverno for at least a day or up to 10 days for in-house workshops. Since 1978, 20,132 copies of books about Alverno's philosophy and educational frameworks have been disseminated, excluding reprints or Office of Research and Evaluation publications. In 1990 alone, 4,278 publications (including reprints but excluding Office of Research and Evaluation publications) were disseminated.

The Office of Research and Evaluation report similar documentation on the degree to which the Office met similar goals from 1977 to 1987 (see second edition of Mentkowski & Doherty, 1983 revised 1984). The Office disseminated 19,800 copies of five major articles and chapters developed from the research outcomes that were also distributed externally by outside publishers.

The Office created 68 publications and made 170 presentations. It responded to 797 requests by mail or during telephone consultations, and subsequently mailed 2,140 publications in response. Research outcomes were described or cited in 14 news articles and at least 56 outside publications. From 1977 to 1987, we reached over 1,895 institutions and representative departments in all 50 states and 29 countries through presentations, together with countless publications distributed during presentations or mailed upon request.

This documentation -- and in particular, the publications and refereed presentations such as this symposium -- is some evidence of eliciting critique and of contribution related to that part of the college's (and the Office of Research and Evaluation's) mission to examine whether and how Alverno frameworks, namely, educational philosophy/principles/practice contribute to general philosophy/principles/practice for undergraduate education (see 1 A in Figure 3). It is also some evidence that the research and evaluation efforts support this larger contribution (see 1 B in Figure 3). What do we mean by Alverno frameworks?

Alverno Educational Frameworks: Some Examples

Various elements of Alverno's educational frameworks: its philosophy, principles and practice, are described and discussed in Alverno literature. Today's purpose is not to illuminate these elements, but rather to enumerate them, so they can serve as a backdrop for a discussion of methods and results from the studies discussed today.

These elements, listed in Figure 3, include:

- liberal arts/professional
- student-centered
- outcome-oriented
- coherent, developmental curriculum (Read & Sharkey, 1985)
    - ability-based, via the disciplines (Alverno College Faculty 1976 revised 1985; Earley, Mentkowski & Shafer, 1980; Loacker & Palola, 1981; Loacker, Cromwell, Fey & Rutherford, 1984; Read, 1980)
    - experiential learning (Doherty, Mentkowski & Conrad, 1978; Hutchings & Wutzdorff, 1988)
    - assessment-as-learning for individual student development, credentialing, program evaluation, and so on (Alverno College Faculty, 1979 revised 1985; Loacker, 1988; Loacker, Cromwell & O'Brien, 1986; Mentkowski & Loacker, 1985).

General Educational Frameworks: Some Examples

Alverno is not alone in developing distinct educational frameworks. Several distinctive educational philosophies/principles/practices have emerged in the literature or are observed in practice at various institutions.

The higher education literature cites certain undergraduate institutions that have been recognized from time to time over the decades as places where a recognizable educational philosophy, principles and practice have been realized (e.g. Harvard University, University of Chicago, Hampshire College, Reed College, University of California-Irvine; University of California-Santa Cruz; Evergreen College, and so on).

Further, distinctive general educational practices have emerged in higher education that have been developed and adapted by various individuals or institutions institutions.

A partial listing in Figure 3 is as follows:

- learning by doing
- core curriculum
- individualized instruction
- education for development
- collaborative learning
- student outcomes assessment
- performance assessment
- interdisciplinary studies
- multicultural curriculum

Question 1 A: Do Alverno Educational Frameworks Contribute?
Question 1 B: Do Alverno Research and Evaluation Frameworks Contribute?
How Do External Audiences as These Questions?

In our experience, before external audiences ask whether Alverno frameworks contribute to general undergraduate philosophy, principles or practice, they ask three questions of the institution. The first is a question of credibility, which often implies a judgment of demonstrated quality. A second question concerns effectiveness. The third is one of validity. Alverno's research and evaluation efforts are one way the College responds to these questions.

In the following series of questions, "it" refers to any aspect of Alverno philosophy, principles or practice of interest to an external audience.

- o Is it credible? Can it be done? Are you actually doing it? To what degree are you as an educational institution actually doing what you put forth as your philosophy, principles and practice?

(Alverno faculty and staff host semi-annual Visitation Days and annual workshops; organize and facilitate multi-institution consortia (three externally funded ones since 1983); and engage in presenting and publishing.)

- o Is it effective? Does this curriculum work well?

(Effectiveness at Alverno rests on sets of institutionalized evaluation processes that ensure internal monitoring, revision and evaluation. The assessment-as-learning process that generates continuous data on student performance, and departmental review processes are just two examples.)

- o Is it valid? Does this learning process cause student outcomes? What is the relationship of the institution's educational frameworks to outcomes?

(Alverno chooses student/alumnae outcomes as the criterion, because student learning is at the heart of and central to the mission of the institution and the primary criterion for its effectiveness. "Do Alverno student outcomes meet Alverno's internal criteria and those external criteria that the college judges relevant to its purposes and mission? Do students and alumnae achieve their potential as human persons?")

Then comes the question of contribution to general undergraduate education (See Question 1 a in Figure 3):

- o To what degree has this institution's frameworks contributed to higher education's educational philosophy, principles and practices?

(Alverno documents its consulting activities and its citations in the external literature.)

Often, the way this question is asked takes another form: "What other institutions have implemented the Alverno frameworks?" We prefer the former rendition of this question, because it does not assume that the test of contribution to a general framework is that another institution "copy" or "imitate" Alverno philosophy, principles or practices. For us, requirements of contextual validity preclude copying or imitating. Rather, contribution to general practice rests on inferences about the degree to which elements of the educational philosophy, principles or practices have been helpful or stimulating to another higher education institution which is developing a curriculum. This other curriculum is expected to be designed in view of the characteristics of the setting and population of that other institution.

Is responding to these questions from external audiences part of Alverno's mission? Yes. At Alverno, questions of quality, effectiveness, and validity are of primary concern from an institutional development perspective. From the beginning, Alverno has believed that the quality, effectiveness, and validity of frameworks in the institution, irrespective of questions raised by outside audiences, is critical to the further development of the frameworks themselves.

One might argue that the contributions from the Alverno frameworks can take place without any kind of extensive research and evaluation of these frameworks beyond what occurs as a result of assessing individual student learning (Alverno College Faculty, 1979 revised 1985; Loacker, Cromwell & O'Brien, 1986) and using the results to improve curriculum in an ongoing way. Most of us can recall examples of educational ideas -- sometimes these are called fads -- which sweep the educational community, even though they may have little justification as developed through either research or practice.

One way such credibility, effectiveness, and validity can be examined is through conducting extensive examinations of these frameworks through studies of student and alumnae outcomes of the learning process, and inviting ongoing critique from one's various constituencies.

More specifically, Alverno's research and evaluation office that tests, investigates, and examines Alverno's philosophy, principles and practice, has this goal: Contribute to the quality, effectiveness and validity of Alverno's learning process (Figure 2).

Once questions of credibility (or quality), effectiveness and validity are dealt with, external audiences ask questions that suggest they themselves are beginning to or are already working at similar curriculum development efforts. Or they may be working at developing institutional assessment, for example. Then these questions surface:

- How did you do it? How can it be done? o What lessons have you learned?
- What about it might work anywhere else? Where might it work? How could it be adapted and still maintain its essential qualities?
- If it's like this (e.g., coherent, developmental, complex), can I use it? What aspects can I use?
- Has anyone else taken it up?
  - philosophy
  - principles
  - practice
  - examples
- Is it different? o Is it better?

Is dealing with these questions part of Alverno's mission? Yes. Alverno expects to contribute to the advancement of undergraduate education and learn from colleagues engaged in similar efforts. Alverno's Office of Research and Evaluation is expected to establish Alverno as a contributor to higher education research and evaluation, and so support these broader efforts.

The external audience questions listed above are also asked of Alverno's research and evaluation philosophy, principles and practices. In addition, external audiences ask:

- o Can research and evaluation studies conducted at one college "add up to anything" across colleges? Can such studies speak to or address issues being raised in different contexts?

To recap, Alverno's primary mission is the personal and professional development of women through education. Thus, faculty create a curriculum and community of learning engaged in the pursuit of knowledge and development of students' abilities. Therefore, an Office of Research and Evaluation goal is to contribute to more generalizable models of adult abilities, learning and development. It is the question of external contribution that is of issue here, rather than questions listed above that deal with how to do and develop institutional assessment. However, the next section is included for the reader who is asking about Question 1 C: How does -- and should -- Alverno do institutional assessment?

Question 1 C: How Should Alverno Do Institutional Assessment?

For many of us in higher education assessment, the major challenge is to demonstrate that institutional assessment can contribute to the improvement of programs in a particular institution. We are interested in how we should do institutional assessment. Symposia on this topic are regular program entries in AAHE's Assessment Forum held annually since 1985.

Therefore, a list of citations follow for the reader interested in how Alverno does institutional assessment, what the overall results are, and how findings are utilized in general. The following references provide such a description, and are available in the order form attached to this paper. Several references synthesize our research and evaluation philosophy, principles and practice (Mentkowski, in press; Mentkowski, 1988a; Mentkowski & Doherty, 1983 revised 1984; Mentkowski & Doherty, 1984; Mentkowski & Loacker, 1985; Mentkowski and Rogers; Read, 1985; Rogers, 1988; Talbott, 1989).

The above mentioned citations describe the following:

- o findings which illustrate how we do research and evaluation and how we meet goals in relation to Alverno's mission and thus support Alverno's contributions to general undergraduate education.

- the organization and funding of the Office, the nature of Office goals and activities, descriptions of the complete set of research and evaluation frameworks, including designs, methods, results, and their utilization; the organization of the Research and Evaluation Committee: how this group of senior faculty work to refine research and evaluation frameworks; its role and function; and Committee contributions.

How should Alverno conduct institutional assessment? We have discussed the issues involved in establishing the validity and integrity of higher education assessment (Mentkowski, 1989), and the importance of establishing a conceptual base for assessment (Mentkowski, 1990a). In these discussions, we have explored the range of criteria that might be applied to higher education assessment studies, and the difficulties in meeting these criteria. For the purposes of today's symposium, we are asking whether our institutional assessment studies can meet the criteria inherent in meeting institutional purposes (which include creating information that can be used to improve programs, or utilization criteria, for example) and those inherent in meeting purposes of external audiences (which include creating information that can be used to advance undergraduate education, or generalizability criteria, for example).

Thus, one internal test of the "goodness" of the studies is the extent to which the findings are actually used by the faculty to inform the educational frameworks of the College. Do results challenge, inform, assist in refinement, or promote the improvement of Alverno philosophy, principles and practices? In short, are the findings used by the faculty to improve the curriculum? Sources cited earlier describe our efforts to meet the criterion of internal contributions, as our Office and our Research and Evaluation Committee work to meet Alverno purposes.

In the next section, Symposium Question Two, we briefly enumerate and describe Alverno frameworks for educational research and evaluation, and cite examples of potential contributions to research and evaluation methods and practice.

SYMPOSIUM QUESTION TWO: TO WHAT DEGREE CAN COLLEGE OUTCOMES STUDIES YIELD NEW KNOWLEDGE RE RESEARCH/EVALUATION/MEASUREMENT METHODS AND PRACTICE, AND ILLUMINATE ITS PHILOSOPHICAL ASSUMPTIONS AND VALUES?

Alverno Question Two: Do Alverno Educational Research and Evaluation Frameworks (Philosophy/Principles/Practice) Contribute To General Principles for Educational Research and Evaluation Practice?

Synopsis

Marcia Mentkowski, Professor of Psychology and Director of the Office of Research and Evaluation at Alverno provides an overview of the coherence and multiplicity inherent in the approaches and strategies that characterize research and evaluation at the College. She identifies some examples of potential contributions to general research and evaluation practice from these integrated, yet diverse approaches and strategies. Then she sets the stage for the five examples of potential contributions to student/adult development, learning and abilities presented by Office of Research and Evaluation staff in the next section. She outlines those examples, and briefly characterizes the setting, population and samples for the five examples.

How is Contribution Defined and What is Evidence?
Examples of Potential Methods Contributions

Alverno frameworks: educational research and evaluation

Alverno publications cited in the last section discuss Alverno research and evaluation philosophy, principles and practice. Figure 3 (see lower, left-hand box) lists some of primary approaches and the accompanying strategies Alverno uses to conduct research and evaluation studies.

It has been our experience that many of these approaches had to be developed as we went along. While we were able to draw on some existing methods, instruments, and practices, we consider the following approaches to be examples of methods we are developing, and to which our colleagues in institutional assessment are contributing as they engage in similar work. Because these have been discussed elsewhere by us and in the external literature, we will only briefly deal with these today.

These overall approaches are listed below, in order to set some context for five examples of contributions that will soon follow, and to identify three of the strategies that are used in the five examples.

- Educational framework-driven institutional assessment
    - Multi-level triangulated designs with multiple internal and external comparisons
    - Collaborative, interdisciplinary office, team, committee
    - Interactive collaboration with faculty/staff
    - Sustained student/alumna participation and benefits
- Demonstrating quality/validity/effectiveness of the learning process
- Describing/ascribing development, abilities, learning
    - Longitudinal analysis of change as a result of curriculum (qualitative, quantitative)
    - Analysis of professional/alumnae abilities
    - Evaluation of general education and the major field
    - Teacher-as-researcher/inquirer studies
- Evaluating/validating assessment-as-learning
    - Contextual validity definition
    - Strategies for validating faculty-designed performance assessment measures
- Defining criteria for "good" assessment

    for example:

    - Coherence/diversity among purposes, designs, methods
    - Utilization/generalizability of methods/results

Our general approaches

A conceptual base is important for assessment (Mentkowski, 1990a). One of our general approaches can be described as educational framework-driven (theory-driven, goal-driven, problem-driven) "institutional assessment" (see Figure 3).[3]

Our institutional assessment philosophy argues that methods should be coherent with Alverno educational frameworks and theories. Thus, educational purposes and research and evaluation questions and methods are inseparable. Institutional assessment processes are grounded in Alverno educational philosophy, "bootstrapped" together with Alverno principles and refined in the context of changing educational practices, as well as changes in the setting (i.e. changes in major field, or characteristics of the student population). This "interactive" research mode, this interdependent character of Alverno's institutional assessment, creates a research and practice relationship that consists of a fabric of relationships that are woven together, where one can no longer speak of a linear, causal dimension of "research influencing practice" or "practice influencing research." Educational purpose and inquiry methods are intertwined and coherent.

As stated earlier, there are various elements of Alverno frameworks that are reflected in our educational research and evaluation philosophy, principles and practices, that will frame our approaches to institutional assessment. Because of these frameworks, these approaches and strategies simultaneously reflect concerns for coherence and diversity.

For example, Alverno is a liberal arts college with emphasis on the personal and professional development of its students, and its curriculum builds on a liberal arts foundation. Consequently, assessment approaches are expected to incorporate multiple perspectives, multidisciplinary approaches, and multiple comparisons, with special attention to choosing external frameworks that open Alverno frameworks to other ones. This diversity and multiplicity is expected to characterize institutional assessment approaches and strategies.

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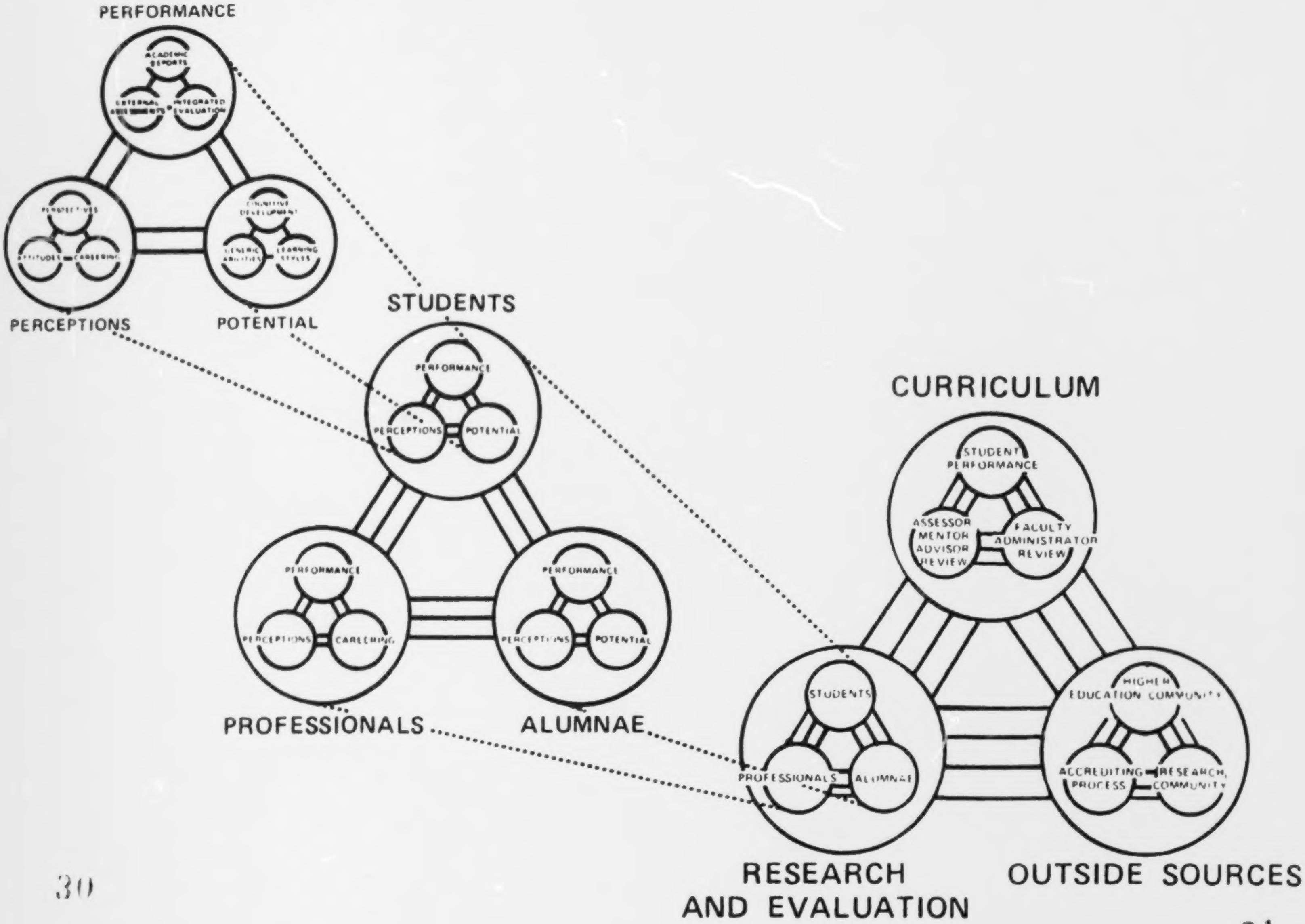
[3] We are now using the term "institutional assessment," and working to define it more broadly, because it is current in higher education, and because our work has been widely cited as an example of institutional assessment. Within our institution, however, we reserve the term "assessment" for another approach that involves all of our students, that is, our faculty-designed assessment-as-learning processes for individual development (Alverno College Faculty, 1979 revised 1985; Loacker, Cromwell & O'Brien, 1986; Mentkowski & Loacker, 1985)).

Because the mission is the personal and professional development of its students, research and evaluation questions reflect a student-centered institution and a concern with whether and how each individual student demonstrates this development. Thus, student outcomes (student/alumna development, learning and abilities) are the "content" of our research and evaluation studies. Alverno educational frameworks include a coherent, developmental, ability-based curriculum with special attention to experiential, self-sustained learning and assessment-as-learning. Student outcomes of the curriculum are the focus of the institutional assessment enterprise.

This student-centered purpose of the institution means that information from institutional inquiry has a central purpose: to enhance student development, learning and abilities. Information must be both useful and general. At the program or institutional level, information indirectly benefits individual students. But clearly, information is expected to be used for student benefits. At the same time, the broader picture of student achievement that emerges is multifaceted and collective, a backdrop against which faculty can interpret an individual student's growth. Pictures that accrue from aggregated sets of information over time are expected to inform curriculum development, but also to question the philosophy and principles upon which it is based. Still, these collective pictures should be easily transformed into intra- and inter-individual patterns that do not lose sight of the individual student's development. The pictures are impressionistic in that, as one steps away, a holistic scene appears. As one looks more closely, each dab of paint, each individual color, each brush stroke is evident.

This developing conceptualization of institutional assessment has emerged at Alverno over the years, and its primary purpose is research, evaluation and validation of student outcomes. It has necessitated the development of multi-level, triangulated designs for research and evaluation of student/alumna outcomes that call for multiple, internal and external comparisons (Mentkowski & Doherty, 1983 revised 1984; Mentkowski & Loacker, 1985). (See Figure 4, "Multi-level triangulated validation design with multiple internal and external comparisons".) We have selected, adapted or developed multiple instruments and methods drawn from our own and external theoretical frameworks.

Figure 4. Multi-level triangulated validation design with multiple internal and external comparisons.


PERFORMANCE
ACADEMIC REPORTS
EXTERNAL ASSESSMENTS
INTEGRATED EVALUATION
PERSPECTIVES
ATTITUDES
CAREERING
COGNITIVE DEVELOPMENT
GENERIC ABILITIES
LEARNING STYLES
PERCEPTIONS
POTENTIAL
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CAREERING
PERFORMANCE
PERCEPTIONS
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PROFESSIONALS
ALUMNAE
CURRICULUM
STUDENT PERFORMANCE
ASSESSOR MENTOR ADVISOR REVIEW
FACULTY ADMINISTRATOR REVIEW
STUDENTS
PROFESSIONALS
ALUMNAE
HIGHER EDUCATION COMMUNITY
ACCREDITING PROCESS
RESEARCH COMMUNITY
RESEARCH AND EVALUATION
OUTSIDE SOURCES

Our approach has also called for the development of a collaborative, inter-disciplinary research office, an interdisciplinary research and evaluation team that does not teach classes or advise students. We have an interdisciplinary research and evaluation committee made up of senior faculty and administrators and chaired by the Director of the Office.

To carry out educational framework-driven institutional assessment, we have developed interactive, interdisciplinary processes that are effective in developing a collaborative interplay that engages faculty questions and contributions (Mentkowski, 1988b). By engaging the whole faculty in question-asking (Mentkowski, in press), and by tapping existing faculty groups related to particular issues, the Office formulates research questions. Nor does faculty leadership and investment stop there. Over the years, faculty have served in various capacities as adjunct members of the research team, as advisors, as interpreters of results, and so on. The Research and Evaluation Committee, comprised of senior-level faculty and administrators, is a springboard and interpreter at the institutional level of question-asking and interpretation. Findings and their interpretations are an outcome of this interplay all the way through the process, from research question, through data collection and analysis, interpretation of results, and making meaning out of the results for curriculum development.

We have been active in creating strategies for question-asking that work to integrate research, evaluation and practice at the national level, in that we actively co-lead and support the AAHE Research Forum (Mentkowski & Chickering, 1987), which has generated a research agenda each year since 1986. This involvement ensures that Alverno's research and evaluation activities are in tune with national questions and issues that educators feel should be the subject of inquiry.

We have also created methods that result in sustained participation of samples of students and alumnae in research and evaluation activities. Key elements are providing rationales and immediate benefits (such as feedback on instrument results) to these participants (Mentkowski, 1989; Mentkowski & Strait, 1983; Reisetter & Sandoval, 1987).

Research and evaluation goals

Recall that two of our research and evaluation goals are to demonstrate quality, validity, and effectiveness of the learning process, and to describe and ascribe student and alumna development, abilities and learning (Figure 2). In order to do this, we have employed a number of more specific strategies. Three are the focus of today's examples.

Strategies that flow from research and evaluation goals

A first strategy is the longitudinal analysis of change as the result of curriculum (Mentkowski, 1990b; Mentkowski & Strait, 1983), which is a strategy for both research and evaluation of the broad outcomes of college. This strategy provides for more short-term evaluation benefits for evaluation of the curriculum at its earlier phases when one is generating information on current students. It provides for more long-term research benefits at its later phases as it works to describe longitudinal antecedents of alumnae abilities, learning and development. Our longitudinal strategies employ both quantitative and qualitative methods. Further, these strategies have used instruments and methods that are drawn from a variety of theoretical frameworks in cognitive development, learning styles, and broad abilities or competences. Because we draw on a range of theoretical frameworks that relate to faculty educational frameworks in student development, learning and abilities for external comparisons, there is potential for contributions to discipline-based theory and method.

A second strategy is analysis of professional/alumnae abilities, where we have worked to describe ability models of outstanding professionals who are not our graduates, and also our graduates, in order to enable faculty to define and refine ability definitions, instruction and assessment-as-learning, and to evaluate their professional or major fields. Because we ask graduates to include examples of activities in other areas of their lives in addition to paid employment, we are also providing faculty with a picture of abilities that are used in personal (e.g., child-rearing; civic involvement; graduate learning) as well as professional domains.

A third strategy builds on the first and second, and extends it for more immediate benefits. This is called evaluation of general education and evaluation of the major field. As mentioned, we have conducted studies that generate ability models for outstanding professionals in each of the three largest major field areas: nursing, management and teaching (Diez, 1990; DeBack & Mentkowski, 1986; Mentkowski, 1988; Mentkowski et al., 1982). Currently, we are working to expand strategies for inter- and intra-individual pattern analyses of student performance throughout the major, using data generated from faculty-designed external assessment measures, including portfolio assessments.

A fourth strategy is one we call "Teacher as Researcher/Inquirer" studies (Research and Evaluation Committee, 1986), which means that individual faculty members or groups of faculty conduct research projects within or across classes for the purposes of direct intervention in teaching and learning activities, so as to improve the immediate relationships between instruction and student learning (Deahl, 1990; Kramp and Humphreys, 1990).

A fifth strategy is evaluating and validating the assessment-as-learning process for individual student development, which includes faculty-designed performance assessment measures. We have developed a workable definition of contextual validity (Mentkowski, 1989; Mentkowski & Rogers; Rogers, 1988) and strategies for validating faculty-designed performance assessment measures (Alverno College Office of Research and Evaluation/Assessment Committee, 1989). The latter have been field-tested with a range of colleges and universities in a FIPSE-funded project (Alverno College/FIPSE Assessment Project, 1987).

Finally, as we mentioned earlier, we are working to define criteria for "good" assessment (Mentkowski, 1989). Today's symposium is an assist for us in this work.

We are drawing examples today from the first three strategies: longitudinal analysis of change related to the curriculum, analysis of professional abilities, and evaluation of the major field (refer to column 5 in Figure 1a, "Five Examples Presented Today").

There are a number of other examples from which we could draw to examine potential contributions to general research and evaluation philosophy, principles, and practice. These are included here to provide context for the reader who might be interested in some of these other examples. All of these examples are a backdrop to those we chose today, as we begin to examine the potential of our work for general contributions.

a) examples where we describing particular uses of educational research and evaluation, methods and meeting expected criteria

  o personnel issues in maintaining longitudinal designs (Mertens & Rogers, 1986); longitudinal data bank management and procedures (Ben-Ur, 1986)

  o procedures for maximizing student and alumnae participation (Mentkowski, 1988b; Mentkowski & Strait, 1983; Reisetter & Sandoval, 1987)

b) examples where we are expanding methods

  o quantitative methods for analyzing Human Potential Measures data (Mentkowski & Strait, 1983)

  o qualitative methods for coding the Measure of Intellectual Development (Knefelkamp, 1974, 1978; Widick, 1975) based on the Perry 1970 Scheme (Mentkowski, Moeser & Strait, 1983).

  o qualitative methods for collecting and analyzing Perspectives Interview data (Deemer, in press; Much, 1979)

  o qualitative methods for analyzing Behavioral Event Interview data (Deback & Mentkowski, 1986; Mentkowski, O'Brien, McEachern & Fowler, 1982; Rogers and Reisetter, 1989)

  o contextual validity definition (Mentkowski, 1989; Mentkowski & Rogers, 1985; Rogers, 1988)

  o strategies for evaluating and validating faculty-designed performance assessment (Alverno College Office of Research and Evaluation/Assessment Committee; 1989).

These approaches to institutional assessment have been cited in the higher education assessment and college outcomes literature and the nature of our contributions has been discussed and critiqued (Astin, 1991; Erwin, 1991; Ewell, 1984, 1985, 1991; Heywood, 1989; Pascarella and Terenzini, 1985; 1991; Terenzini, 1989b). These citations suggest that some external audiences find these approaches useful for examining or describing more general approaches. Participants at Alverno workshops from other institutions provide an external test of such contributions.

We now turn to examples of contributions to discipline-based theory and method in student/adult development, learning and abilities (refer to column 5 in Figure 1a, "Five Examples Presented Today").

SYMPOSIUM QUESTION THREE: TO WHAT DEGREE CAN COLLEGE OUTCOMES STUDIES CONTRIBUTE NEW KNOWLEDGE TO DISCIPLINE-BASED THEORIES AND METHODS IN STUDENT/ADULT DEVELOPMENT, LEARNING AND ABILITIES, WHICH CAN FORM A PARTIAL BASE FOR UNDERGRADUATE EDUCATIONAL PRACTICE?

Alverno Question Three: Do Alverno Research Methods and Results Contribute To Discipline-Based Theory and Methods in Student/Adult Development, Learning and Abilities?

There are a number of examples from our ongoing work that can serve as examples of contributions. We list several below, and then move on to the selection of the five we chose for this symposium, because they illustrate diverse theoretical frameworks in development, learning and abilities. These theoretical frameworks, which form the "content" of the five examples that follow, are enumerated and illustrated in the context of the five examples.

Figure 3 illustrates the way in which research activities that take place in a particular setting with a particular population (see circle on the left side of the graphic) benefit from theoretical frameworks that are externally derived, but symbiotic to the educational frameworks derived from faculty practice (upper left hand box). Similarly, on the right side of the graphic, a "picture of human potential" is one goal of discipline-based theory and method in student/adult development, learning and abilities. This picture of human potential, via discipline-based theory and methods, benefits from research activities that are conducted in various settings. In either case, contributions from discipline-based theory and methods to a particular setting, and likewise contributions from a particular setting to discipline-based theory and methods, need to be explored.

How is Contribution Defined and What is Evidence: Examples for Potential Methods and Results Contributions to Student/Adult Development, Learning and Abilities

How is contribution defined and what is evidence? Examples follow:

a) examples where we are studying adult development, abilities and learning with accepted strategies and meeting expected criteria

   o contributing to the validity of the Human Potential Measures (a battery of twelve externally-designed measures of cognitive, moral and ego development, learning styles and generic abilities) by expanding the sample of adult women, providing longitudinal trajectories (four data points) during college and afterward, and relating change to performance in the curriculum (Ben-Ur, Rogers, Reisetter & Mentkowski, 1987; Mentkowski & Strait, 1983)

b) examples where we are expanding discipline-based methods in adult development, adult abilities and learning

  - contributing to scoring procedures and manual development for the Washington University Sentence Completion Test, which is based on Jane Loevinger's (1976) theory of ego development (Mentkowski, Miller, Davies, Monroe & Popovic, 1981)
  - identifying indicators of career development for women (Giencke-Holl, Mentkowski, Much, Mertens, & Rogers, 1985)

c) examples where we are developing methods for discipline-based theory in adult development, adult abilities and learning

  - analysis of intra and inter-individual patterns in abilities, learning, personal and professional development (Mentkowski, 1990b)
  - measurement of the Perry (1970) scheme of intellectual and ethical development (Mentkowski, Moeser & Strait, 1983)
  - methods for analyzing longitudinal, indepth, confidential interviews of student perspectives during college and afterward (Deemer, in press; Much, 1979)
  - measurement of employment and career trajectories of women
  - Behavioral Event Interview methods for alumnae performance studies drawn from David McClelland and George Klemp's Job Competence Assessment methods (Rogers & Reisetter, 1989)
  - strategies for establishing scoring reliability for the Picture Story Exercise (Winter, McClelland & Stewart, 1981)

d) examples where we are developing discipline-based theory in adult development, adult abilities and adult learning

  - longitudinal descriptions of self-sustained learning (Mentkowski, 1988a; Much & Mentkowski, 1984) and other developmental domains; description of a "recycling" phenomenon in development (Mentkowski, 1988a)
  - descriptions of alumnae generic abilities across a range of settings and activities
  - descriptions of professional abilities (DeBack & Mentkowski, 1986; Diez, 1990; Mentkowski, et al., 1982)

Figure 5 lists some research questions that define student/alumna/professional comparisons, and graphs these comparisons.

These broad questions are:

- o What development, learning and ability outcomes are evident during (student outcomes) and after (alumna outcomes) Alverno?
- o How do alumna outcomes compare to student outcomes?
- o How are outcomes developed?
    - o How are student and alumna outcomes related to an Alverno education?
    - o What factors after college help/hinder abilities, learning and development?
- o Are student/alumna outcomes "good" compared to criteria/standards drawn from Alverno frameworks and professional criteria?

Figure 5. Research questions that define student/alumna/professional comparisons.

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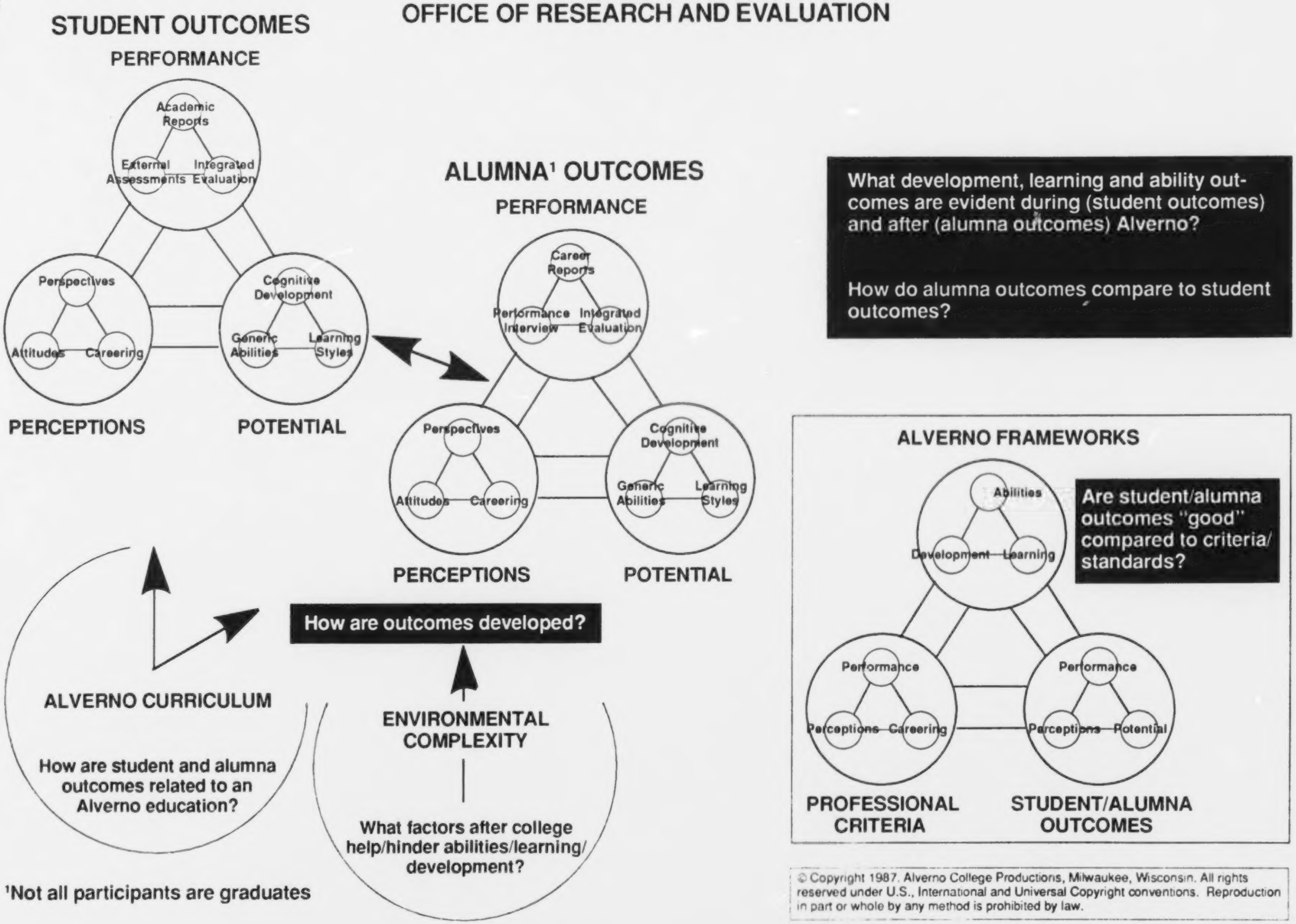

STUDENT OUTCOMES

PERFORMANCE

Academic Reports

External Assessments

Integrated Evaluation

Perspectives

Attitudes

Careering

Cognitive Development

Generic Abilities

Learning Styles

PERCEPTIONS

POTENTIAL

ALUMNA[1] OUTCOMES

PERFORMANCE

Career Reports

Performance Interview

Integrated Evaluation

Perspectives

Attitudes

Careering

Cognitive Development

Generic Abilities

Learning Styles

PERCEPTIONS

POTENTIAL

What development, learning and ability outcomes are evident during (student outcomes) and after (alumna outcomes) Alverno?

How do alumna outcomes compare to student outcomes?

ALVERNO FRAMEWORKS

Abilities

Development

Learning

Are student/alumna outcomes "good" compared to criteria/ standards?

Performance

Perceptions

Careering

Performance

Perceptions

Potential

PROFESSIONAL CRITERIA

STUDENT/ALUMNA OUTCOMES

How are outcomes developed?

ALVERNO CURRICULUM

How are student and alumna outcomes related to an Alverno education?

ENVIRONMENTAL COMPLEXITY

What factors after college help/hinder abilities/learning/ development?

[1]Not all participants are graduates

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Today, five questions from our research and evaluation program are embedded in five examples from our work:

(1) What broad patterns describe development during college and afterward, and how are these patterns related to curriculum (cognitive, moral and ego development)?

(2) What learning outcomes describe development, and what curricular elements cause it from the student's perspective (self-sustained learning and development)?

(3) Do women graduates realize their goals (career trajectories of women)?

(4) How do graduates perform in personal and professional domains (alumnae generic abilities)?

(5) How do abilities derived from studies of outstanding professionals link to evaluation of student outcomes in the major field (professional abilities and student outcomes)?

(See Figure 1a, side 2: "Five Alverno Examples" and below.)

EXAMPLE	METHOD
Cognitive, moral and ego development trajectories	Longitudinal analysis of change in relation to the curriculum
Self-sustained learning & development	Same as above
Career trajectories of women	Same as above
Alumnae generic abilities	Analysis of alumnae abilities
Professional abilities and student outcomes	Analysis of professional abilities Evaluation of general education and the major field

Three questions organize the five examples we now present for the purposes of this symposium:

- What did we learn that contributes to pictures of human potential in development, learning and abilities?
- How does this study simultaneously contribute to both internal and external purposes?
- What are the unresolved issues?

A final question, "Which criteria apply?," will be addressed in the final section.

THE CONTEXT FOR THE EXAMPLES: Setting, Population and Samples

Figure 3 shows a circle on the left side of the graphic that illustrates how research, evaluation and measurement activities work interactively with curriculum development and practice in interdependent ways. Clearly, in a particular institution, such activities revolve around institutional characteristics and the population of students who attend the college. For examples of studies that we are presenting today, samples are drawn from the larger population, over time. Following is a brief description of the setting, population, and samples on which results discussed are based.

Description of the Setting

Alverno College, a liberal arts college for women in Milwaukee, Wisconsin, has an enrollment of over 2,400 degree students in both weekday and weekend time frames. Generally, students are from southeastern Wisconsin, are first-generation college students, and work during and after college. Alverno, which has focused for a century on preparing women for professional careers, formally adopted an outcome-centered approach to its curriculum in 1973, accrediting students for progressive demonstration of certain broad abilities via the disciplines across all subject areas: communication, analysis, problem solving, valuing , social interaction, taking responsibility for the global environment, effective citizenship, and aesthetic responsiveness.

Description of the Population

Characteristics of the student body

Alverno's enrollment has tripled since the beginning of the institutionalization of the Office of Research and Evaluation, and the start of its longitudinal study in 1976. In the last decade, the college's population of more traditional-aged students in its weekday time frame has more than doubled. The current enrollment is characterized by a considerable diversity of ages, ethnic and social background.

> In comparison to national statistics on post-secondary enrollment, where approximately 30% of the women students are over age 30, over 50% of Alverno's students are over 30.
>
> College enrollments for minority students have increased nationally to about 21%; at Alverno, the distribution of minority students has doubled in the last decade and is now at 19%. Total minority enrollment for the State of Wisconsin is 6%.
>
> About 30% of the students are married.

A fuller description of the student enrollment and a comparison with national statistics is provided in Appendix A.

Description of the Sample

Description of the longitudinal sample

The longitudinal sample is composed of all women entering the college in Fall, 1976 and 1977 (N = 705). (Cross-sectional studies involved additional groups but results are not part of the five examples presented here.) The rules for eligibility and the rates of participation result in certain changes in the sample across four times of assessment. At the fourth time of assessment, 358 women were eligible members of the sample.

The sample of 358 is divided into three cohorts:

- 25% from Weekday students entering in 1976.
- 32% from the Weekday students entering in 1977.
- 43% from the Weekend students entering in 1977.

In comparison to the current enrollment, the longitudinal sample tended to be younger, with fewer minorities. Specific characteristics of the sample and a fuller comparison with current enrollment in provided in Appendix B.

Issues Related to the Sample

There are several issues surrounding development of the sample for such studies. Usually, in conducting research, one selects a sample that enables one to investigate a particular problem. In educational research in a particular setting, the sample has been chosen through the admissions process. Thus, unknown factors may be at work in sample selection; these will likely remain uncontrolled. Hard-money institutional funds for research are for the most part, limited to those individuals who are in attendance at the college, or who are graduates.

While it may seem at first blush that prior selection of the sample is uncommon, we have only to look at the overwhelming participation of the college sophomore in social science research to know that such selection of the sample prior to the selection of the problem is not uncommon in the literature. What is different, however, is that the faculty at large, not limited to a committee for the protection of human subjects, is concerned with what happens to students as a result of participation in research. In our case, the ultimate protection derives from the purposes of the research, for improved teaching and learning.

Is the population and the sample adequate? In our experience, the question of sample representativeness and generalizability is of equal interest to our college faculty and to outside parties. Faculty are interested because they, like outside parties, do not want to over-generalize from a sample to the current population of students, or from group results to an individual student. Thus, challenges to sample representativeness come from our own faculty as well as outside parties.

In the beginning, we took for granted that our own faculty would generalize from one student population to another because we had researched their own students as a whole. The currency of the student population became central to the issue of generalizability, however, because faculty were unwilling to generalize just because the sample was made up of individuals who had been their own students or were graduates. Their concern for dealing with individual differences and the individual student rightly surfaced. Thus, description of the population and the representativeness of the sample are critical to examining issues of generalizability and utilization to Alverno faculty, as they are to outside audiences (Ben-Ur, et al., 1989).

The questions concerning adequacy of the sample, differ, however. Alverno faculty ask: Is the sample representative of the population of current students? Is the sample credible? Is the sample inclusive? To what extent can one generalize from results from prior students or graduates to students now, or future graduates? Outside audiences ask: How is the Alverno population representative of college students? How is the Alverno population different from students at my college? The point here is that questions of sample representation and generalizability are equally important for internal and external purposes.

FIVE EXAMPLES OF POTENTIAL CONTRIBUTIONS TO THEORY AND METHOD IN ADULT DEVELOPMENT, LEARNING AND ABILITIES

Six members of the Office of Research and Evaluation staff will illustrate five examples of contributions from research and evaluation studies. Each will briefly describe contributions of methods and results, and then identify internal and external contributions, that is, strengths and weaknesses for providing a) usable findings for faculty engaged in improving in-house student learning and programs, and b) insights for external audiences engaged in creating new methods or theory building in adult abilities, learning and development.

Synopsis

Data sources. Results are reported from a) curriculum-embedded performance assessments, and b) a longitudinal design using 17 external measures administered on four occasions (76/77; 78/79; 80/81; 86/87) to the entire entering classes of 1976 and 1977 N=706). Measures of abilities, learning styles, motivation, cognitive, moral and ego development were employed along with indepth, confidential interviews, surveys of student perceptions and background characteristics, and behavioral event interviews (McClelland, 1978) of alumnae. The latter serves as a criterion measure for alumnae performance across professions. Student participation rates ranged from 84 to 99 percent; alumnae (N=358) rates ranged from 59 to 88 percent (see Appendix B). Data from curriculum-embedded performance assessments in the curriculum, with background factors controlled, were related to changes on external measures using multiple linear regression, ANOVA for repeated measures and path analysis. Interviews were coded via ethnographic and thematic analysis. Student portfolios and other curriculum performance assessments were judged on dimensions of performance by expert judges and related to abilities that define the major.

EXAMPLE I: COGNITIVE, MORAL AND EGO DEVELOPMENT TRAJECTORIES

Synopsis

Judy Reisetter describes patterns of development on measures of cognitive, moral, and ego development in relation to performance in the curriculum. These findings contribute to research on these developmental domains by extending the longitudinal data we have on development of women during college and then into and beyond the transition after college. The presence of substantial numbers of non-traditional aged women in the sample who tend to be older (age at entrance to college is 17 - 55, x = 27) allows examination of the robustness of the findings for women across age cohorts.

Although cross-sectional findings show ego-development gains during college, longitudinal findings are consistent with other studies using Loevinger and Wessler's (1970) Sentence Completion Test (SCT) that show no gains during college (Jane Loevinger, Personal Communication, July 22, 1990). Contrary to expectation, data show gains after college. Gains accrue during and after college on Watson and Glaser's (1964) Critical Thinking Appraisal (CTA). Gains accrue during college and plateau after college on Rest's (1979a) Defining Issues Test (DIT). College gains are associated with progress in the curriculum.

Findings suggest that college outcomes are broad, developmental, and enduring. Students in an ability-based curriculum show gains during and after college on a traditional measure of critical thinking. Results confirm Rest's (1986) findings on the effects of education on moral development, but provide more specific evidence for curricular effects. Gains in ego development after college is a new and unexpected finding. Developmental trajectories have the potential to inform faculty practice at a broad level.

COGNITIVE, MORAL, AND EGO DEVELOPMENT TRAJECTORIES

What are the patterns of development on measures of cognitive, moral, and ego development in relation to performance in the curriculum? How do we contribute? In some ways the criteria converge for internal benefit and external benefit; that is, contribution of these findings on campus converge with contribution to disciplinary research. Because of this convergence, college outcomes studies may in some ways facilitate systematic collection of data that make analyses of important research questions more feasible.

Let's begin by noting the commonalities of contribution on campus and contribution to disciplinary research theory. First, an articulated understanding of the effects of different population parameters is needed both for use on campus and for understanding the generalizability of theory across population and setting. In other words, a campus question directed toward the research findings is, are the findings robust across groups in the sample? A discipline-based research question directed toward the findings is, how well does the theory generalize to and across the population in this setting? Thus, colleges using measures developed in the disciplines (in this case cognitive, moral, and ego development) can provide a different setting and population to test disciplinary theory, and thereby contribute to theory development.

A second commonality is investigating change through time. Understanding change through time is crucial criterion by which faculty understand student development and is a crucial component of developmental theory.

A third commonality is showing a relationship between education and development. Linking the college's curriculum to student development generates faculty interest in the findings. Indeed, most colleges are interested in contributing to student development on broad outcomes such as cognitive, moral, and socio-emotional development. Through institutional assessment, colleges can conduct college outcomes studies that include measures of these constructs. This can provide theorists with the opportunity to summarize studies of the effects of different curriculums on college outcomes or the effect of college in general. Colleges are already invested in collecting data on individual students and their progress in the curriculum. As they become committed to linking curriculum to broad student outcomes, the potential for contribution to developmental theory can build upon the college's ongoing archiving of data.

A fourth common contribution is the use of multiple measures that span domains. We have noted, along with Peter Ewell, Robert Pace, Sandy Astin, and Trudy Banta, that effective use of findings on campus from a broad outcome measure is facilitated by having multiple measures. Of course, having multiple measures across domains contributes to interpreting research findings, as well. On our own campus, the multiplicity of measures across domains has been an important feature in the display and interpretation of findings. So, in the alumnae follow-up to the Alverno Longitudinal Study, we asked participants to complete ten of the externally developed measures of human potential that they completed as students. In this paper, we discuss three that we have scored and analyzed for the alumnae extension of the longitudinal study, in order to illustrate the research contribution that accrues from having multiple instruments across domains.

Cognitive Development: Critical Thinking Appraisal

One of the three instruments is the Critical Thinking Appraisal (Watson & Glaser, 1964). This is a traditional and time tested recognition task, often used as a measure of college outcomes. It attempts to measure several components of critical thinking. Of the five subscales, we administered three of them: the ability to draw reasonable inferences, the ability to recognize assumptions of an argument, and the ability to draw valid deductions. These subscales may be overlapping facets of critical thinking, however (Watson & Glaser, 1964). We used this measure because in 1976 it was regarded as a common test of critical thinking. Actually, of all of our measures, this measure may map on the least well to Alverno faculty descriptions of critical thinking, because of its recognition format.

Moral Development: Defining Issues Test

A second instrument is the Defining Issues Test (Rest, 1979a; 1979b; 1986). This instrument is derived from Kohlberg's theory of moral development. Rest's conceptualization of the development of moral judgment is different from Kohlberg's in some ways, for example Rest (1979b, 1986) believes in a more complex model that presumes stage mixture, rather than a hard stage model. The DIT provides a measure of an individual's sophistication in moral judgment through a task that asks the participant to choose between alternative considerations that should go into making a judgment. The P percent measure that we are reporting is interpreted as the relative importance of a subject gives to principled moral considerations in making decisions in relation to six moral dilemmas. We are reporting scores for those participants who completed the DIT in such a way that they meet Rest's criteria that increase the validity of their score (Rest, 1979b).

Ego Development: Washington University Sentence Completion Test

A third instrument is Loevinger's (Loevinger & Wessler, 1970; Loevinger, Redmore, & Wessler, 1970) Sentence Completion Test of Ego Development. This is a production task that attempts to elicit an individual's stage of Ego Development. Ego is defined by Loevinger as one's style of life, the unity of personality individuality, the method of facing problems, opinions about oneself and the problems of life, and the whole attitude for making choices in all of life's spheres (Loevinger, 1976; Loevinger & Knoll, 1983). For the purpose of this presentation, we are using the automatic scoring rules for summarizing an individual's total protocol of 36 responses.

Having noted these commonalities, let me return to these points in relation to our own longitudinal study. In relation to developmental theory's interest in change through time, the Alverno Longitudinal Study extends the longitudinal assessments over a ten-year period, from entrance to college to five years after college. This significantly extends the amount of longitudinal information on developmental trajectories during college to after college. The transition from college to post-college settings represents a potentially important developmental phase.

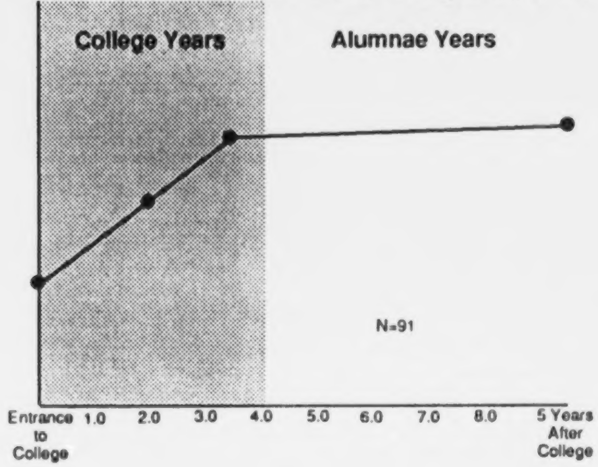
In addition, the presence of substantial numbers of returning women in the Alverno sample allowed us to examine the robustness of the findings across different cohorts of women who range in age from 17 to 56 years (M = 27) and who have had different experiences. Disciplinary theorists are interested in generalizing theories to a range of populations and settings, as well as describing theory boundaries.

Finally, our use of multiple measures that span across developmental domains has increased the interpretability of the aggregate findings and has provided information relevant to the construct validity of the measures used. In order to demonstrate this point, let us begin with a schematic overview of the aggregate Multivariate Analysis of Variance (MANOVA) results (See Figure 1-1). The repeated measures MANOVA analyses for unequal N's tested for the linear, quadratic, and (where four times of assessment were analyzed) cubic trends through Time, using orthogonal polynomial contrasts. Weights were used to adjust for the unequal lengths of time between intervals.

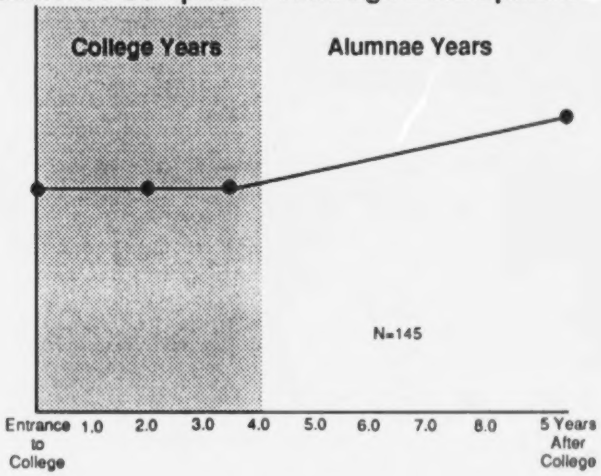
As you can see in the Figure I-1 schematic, we have different trends through time for each of the instruments. The differential pattern of results on these different measures has implications for the construct validity of the instruments. For example, one issue in Loevinger's Sentence Completion Test of Ego Development is whether it measures something separate from Cognitive Development or Moral Development. Loevinger (1979; 1985) points out that interpreting the validity of the Sentence Completion Test requires addressing the stage of ego-development that is measured. Measures of multiple constructs through time allows us to understand how change on one developmental measure is related to status or change on another developmental measure (cf. Lee & Snarey, 1988; Kitchner, King, Davison, Parker, & Woods, 1984). Our preliminary analysis of these aggregate findings is not yet related to specific scale values of change, but Lee and Snarey (1988) have included data from our study in a meta-analysis of the relationship between Loevinger's scoring of Ego Development and Kohlberg's scoring of Moral Development.

Figure I-1. Schematic representation of results on human potential measures

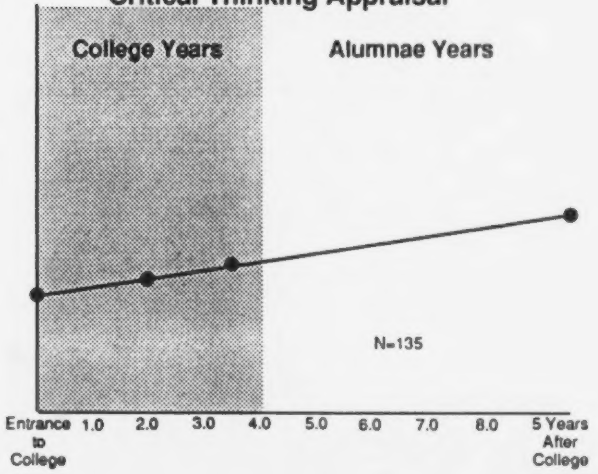
Defining Issues Test: Moral Judgment (P%)



Sentence Completion Test: Ego Development



Critical Thinking Appraisal



In our own analyses, we note that the aggregate trend for the percentage of Principled Thinking levels off during the same period that gains are being made on Stage of Ego Development. Given findings from other studies, we would not interpret the flattening out of the Principled Thinking trajectory as a ceiling effect (cf. Thoma & Davison, 1983). Investigating these differential patterns is important to the construct validity of these measures because interpreting correlation between these measures of related but different constructs is difficult (Loevinger, 1979; Rest, 1979a). For example correlations can be attenuated by restricted range or be the result or the actual covariance of the different constructs. In our sample the empirical correlation between the SCT and the DIT at entrance to Alverno ranged from .04 to .35.

Let us now briefly look at change on each of these measures separately according to their own scale of measurement. Appendix C displays the results of the MANOVA analyses, as well as means and standard deviations for statistically significant effects.

We are often asked how our students perform on traditional measures of cognition, because we have an ability-based curriculum. In general, participants showed gains during and after college on the three subscales of the Critical Thinking Appraisal (see Figures I-2, I-3, and I-4), and these gains are robust across age groups.

Within the domain of moral development, we are investigating change through the Defining Issues Test (Rest, 1979a). The Moral Judgment Interview (Colby, Kohlberg, and collaborators, 1987) was administered to a sub-sample, but we have not analyzed the alumnae data yet. Again, you can see that aggregate change on the Defining Issues Test is toward greater preference for Principled Thinking about moral dilemmas during college, and that these gains plateau out after Alverno (see Figure I-5). We have found that the gains during Alverno are associated with our primary measure of progress in the curriculum, and that this relationship to progress in the curriculum remains even after we have used regression procedures to statistically control for background variables (see Mentkowski and Strait, 1983). These results are consistent with Rest's (1979b; 1986) finding of a robust relationship between formal education and the sophistication of moral judgment. We have demonstrated a relationship to a coherent, developmental, ability-based curriculum.

In contrast, we did not find a robust and positive relationship between student progress through the Alverno ability-based curriculum and change on the Critical Thinking Appraisal (see Mentkowski & Strait, 1983). Findings for both the Defining Issues Test and the Critical Thinking Appraisal are consistent with the expectation that college outcomes are broad, developmental, and enduring. The relationship of the Critical Thinking Appraisal to progress in the curriculum remains undemonstrated. The lack of robust relationship to the curriculum might be attributable to measurement issues (see Rogers & Mentkowski, 1985). For example, one issue involves the sensitivity of the progress in the curriculum measure in relation to the changes on the Critical Thinking Appraisal that occur across widely spaced intervals of one and a half to two years.

Figure I-2. Critical Thinking Appraisal: Inference subscale.

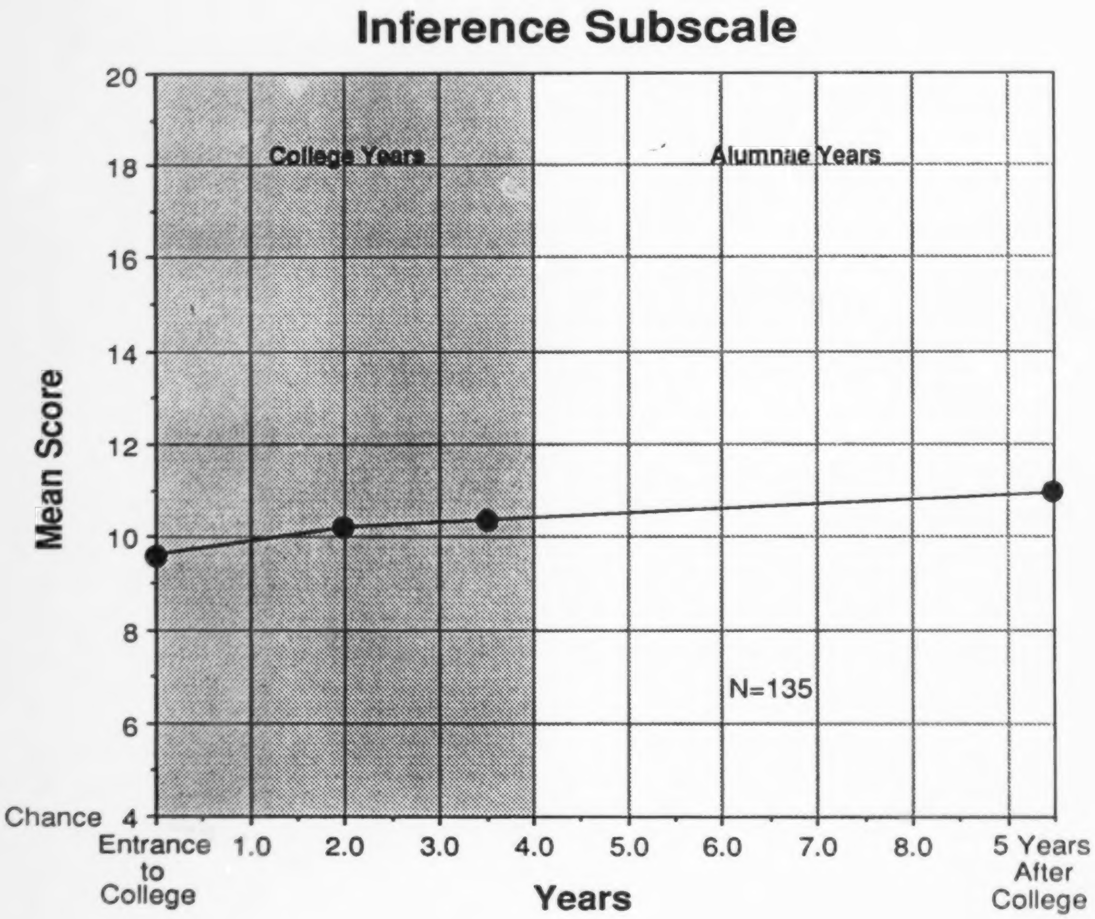


Figure I-3. Critical Thinking Appraisal: Recognition of Assumptions

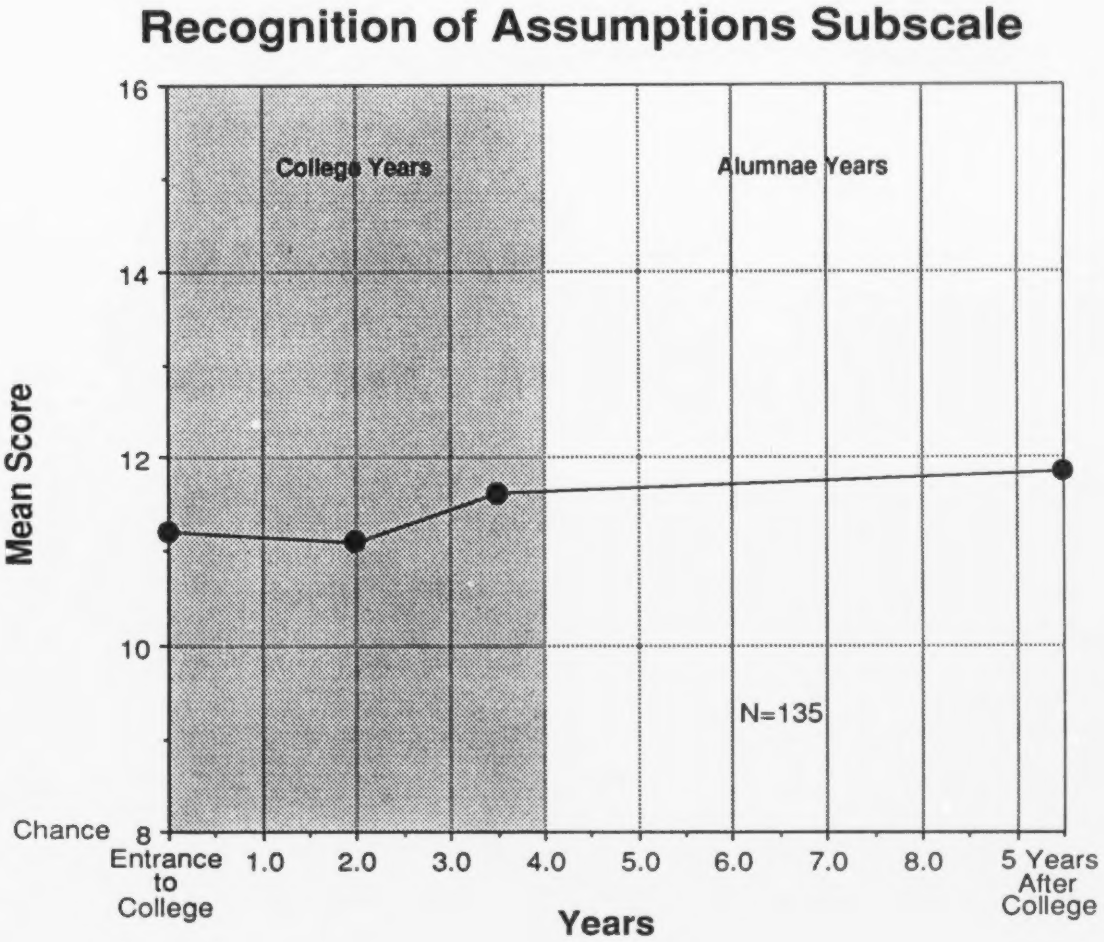


Figure I-4. Critical Thinking Appraisal: Deduction subscale.

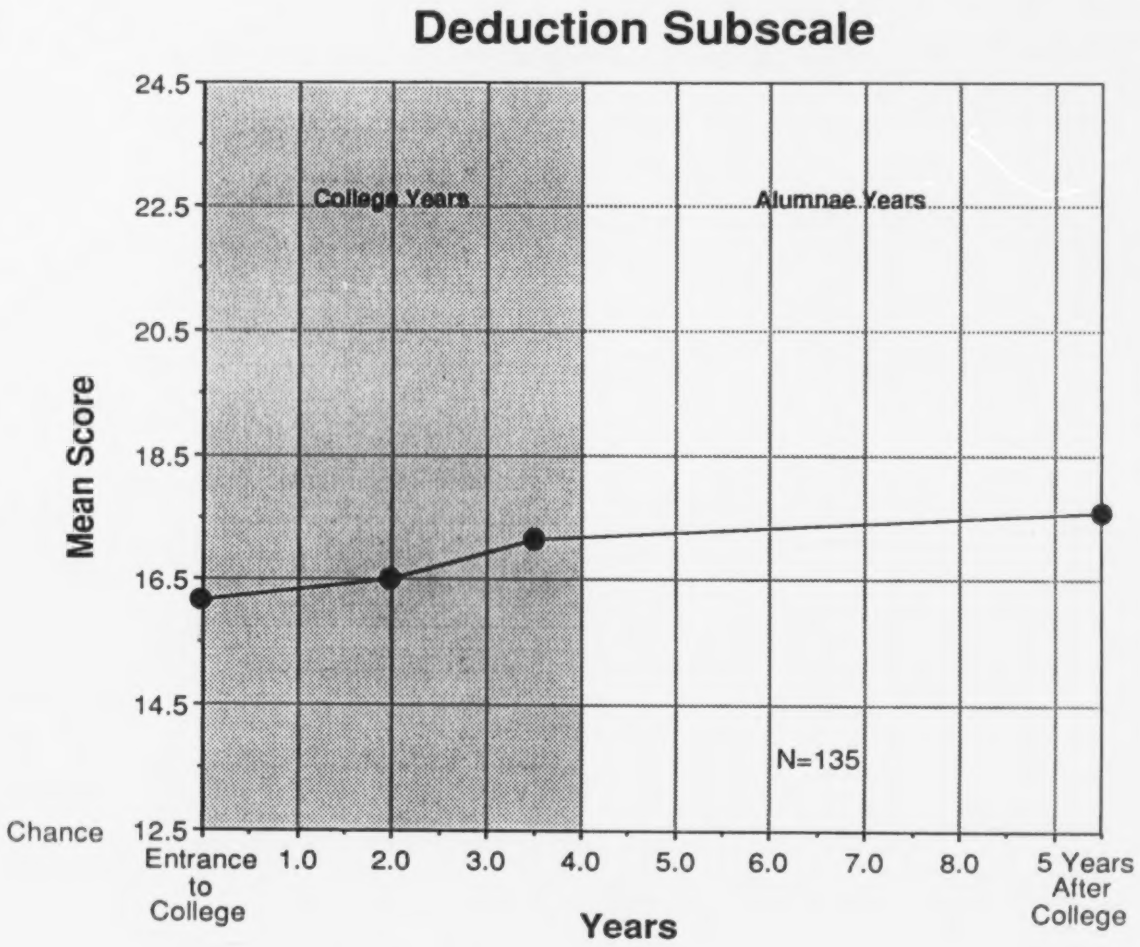
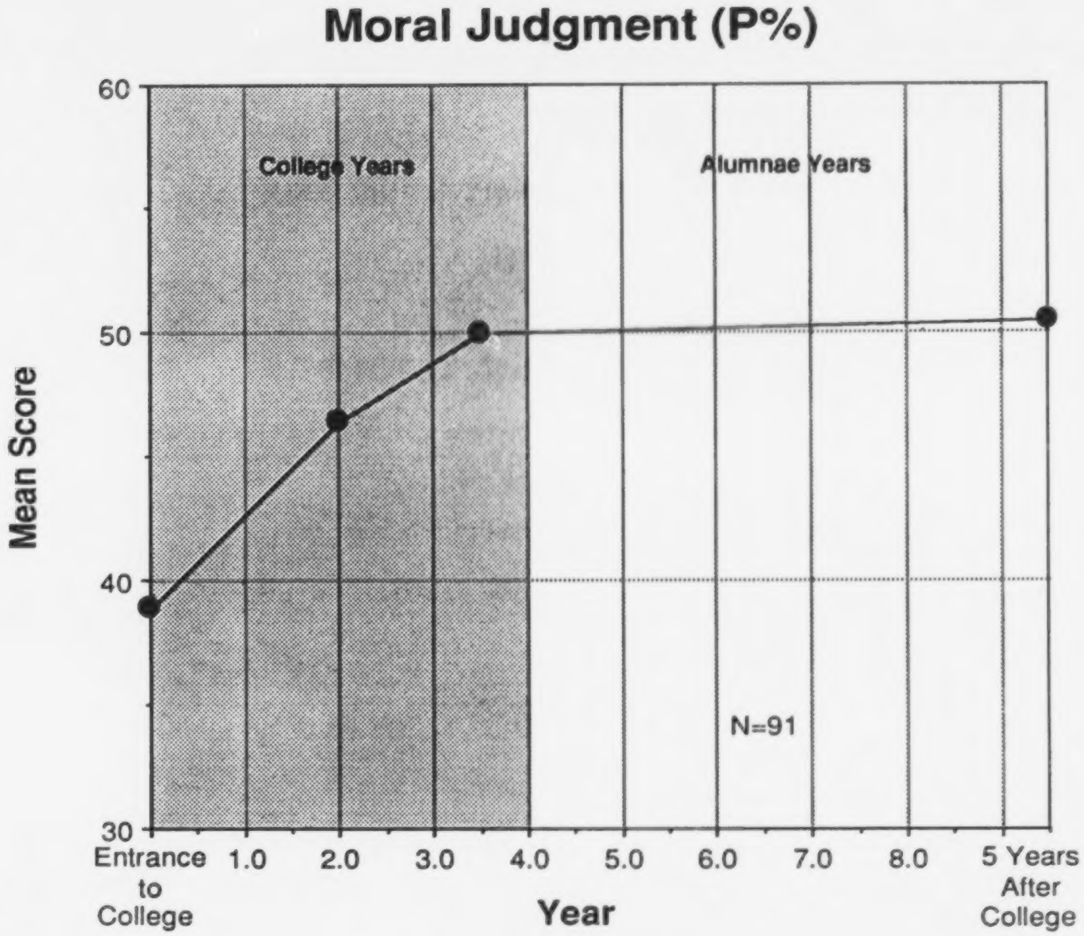


Figure I-5. Defining Issues Test: Moral Judgment (P%)

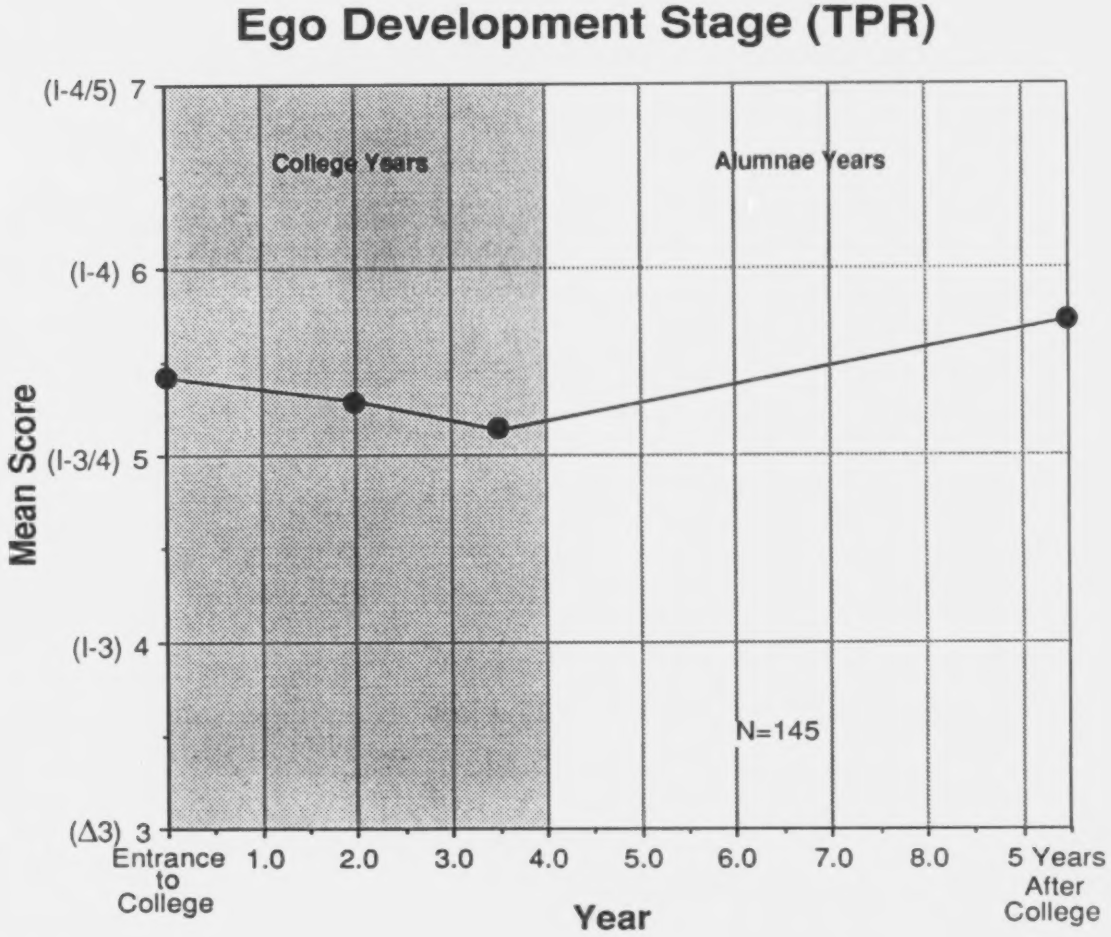


Nonetheless, we have been able to develop some articulated understanding of the probability of a causal relationship between the curriculum and our outcome measures. The primary progress in the curriculum measure that we have used capitalizes on the explicit sequencing of ability levels in the curriculum. Our reasoning was that if the Alverno ability-based curriculum is a causal factor in the growth demonstrated on these measures, then the number of performance-based assessments successfully completed in the curriculum should be associated with this growth.

Of course, other possible explanations for the association between progress in the curriculum and changes on the DIT are always possible, but by collecting information on a range of variables that describes much of the existing heterogeneity in the population (age, program, prior college experience, high school GPA, etc), we have been able to investigate -- to some degree -- whether these variables might qualify the findings. Although we recognize the casual analyses we have conducted are merely consistent with our causal inferences, taking the step toward linking a specific and whole curriculum with gains on human potential measures provides an important interpretative fulcrum.

On one measure we did not show any change during college. Although our analysis of a cross-sectional comparison group suggested ego-development gains during college, longitudinal findings are consistent with other studies using Loevinger and Wessler's (1970) Sentence Completion Test (SCT) that show no gains during college (Loevinger, 1985), although some change is reported by others (Loxley & Whitely, 1986). But, because our sample includes a post-college trajectory for these women, we are able to give information on post-college growth, and we are not aware of any other studies with information on this post-college transition. Loevinger (Personal communication, July 1990) has told us that she does not expect growth after college. Our MANOVA analysis of the scores, however (see Tables 7 & 8 in Appendix C), suggests that there is upward growth on Ego Development after Alverno (see Figure I-6). One of our first questions is, is it real? There is a statistically significant linear and quadratic effect (Table 8 in Appendix C), which supports the interpretation of no change during college followed by gains after college (see Figure I-6). We have not yet analyzed how two conditions of test administration (mailed to alumnae versus alumnae coming to Alverno) might affect the alumnae results. We have only just begun the process of interpreting and analyzing the data. One of our questions is how background variables might qualify or help explain the results. We do not feel that we have investigated this question adequately yet, and the number of cases in the analyses prevents matching participants on all background variables. Previous research suggests that Ego Development may be positively associated with Parent's Socio-Economic status (see Browning, 1987) when the age of the participant is controlled. In our sample approximately 25% of the women have a mother who has not completed high school. For the purposes of the MANOVA, these women were compared with those whose mother's completed a high school degree or above. Only the first, second, and alumnae times of assessment were included in this analysis, yielding minimally adequate cell sizes of (Ns = 11, 15, and 30) for the lower values of Mother's education.

Figure I-6. Sentence Completion Test of Ego Development: Automatic total protocol (TPR) rating of 36 items.



Although neither Age at entrance nor Mother's Education were statistically significant in this MANOVA analysis (see Tables 10 & 11 in Appendix C), these analyses should be taken as preliminary and only suggestive. We note again that there is some restriction in the range of the Mother's Education variable and that the participant's Age may be associated complexly with other variables in this sample. Still, for our sample we have not yet uncovered any simple relationship between Age, Mother's Education, and change in Ego Development. We tentatively conclude that gain in Ego Development is relatively robust across the broad Age categories and the high school versus higher educational attainment category for Mother's education.

Contributions.

The current findings contribute to the existing information on adult development, by extending the information researchers have on Ego and Moral development during college to the transition to five years after college. We have been able to suggest that there may be post-college changes in Ego Development, and to confirm that the development of sophistication in moral judgment may be generally maintained after college. The data is significant not only because of the longitudinal time frame it covers, but also because of the multiplicity of measures used. Already, we have been able to support the construct validity of the measures by showing showing divergent trends on the related, but different constructs. As we seek to understand the hows and whys of these divergent trends, we expect that we able to contribute to the disciplinary understanding of how development across moral, ego, and cognitive domains are related to one another. Already, we have contributed by linking the investigation of change across these measures to the participant's progress in the curriculum.

Unresolved Issues

Although there is a meaningful convergence between many of the criteria for disciplinary research and for utilization of findings on campus, there is also some divergence. For example, one central criteria for utilization is the timeliness of reports. Findings from the longitudinal administration of the student potential measures were reported as soon as possible (Mentkowski & Strait, 1983; Mentkowski, Moeser, & Strait, 1983). The developmental theory used in the research has informed thinking on curriculum revision. For example, Perry's (1970) theory of intellectual and ethical development and Kolb's (1984) experiential learning theory have resonated with faculty thinking.

Nonetheless disciplinary researchers are in some ways more invested than faculty in using specific findings from the longitudinal measures of human potential. In particular, the findings might have a half-life on campus, where their initial impact decays over time. Recently, the time frame for collecting the longitudinal data has begun to lead to the unexpected concern over whether the findings from the study generalize to the same college from which the data were collected. Faculty are acutely sensitive to the individual differences in their students and are constantly adjusting and improving the curriculum.

A new faculty member may be excited about interpreting the data for the purpose of curriculum revision. A more experienced faculty member may view the data as more likely true of former students only, taught when the curriculum was less developed. Alumnae findings on cognitive, moral, and ego development trajectories will, we expect, infuse a renewed interest in the findings, as faculty confront the question of how enduring the effects of the curriculum may be.

We are still addressing a range of questions. What measures are appropriate for college outcomes measures, and how much change might we expect? Ego Development does not appear to have changed during college, but then it is a very broad construct. Did college in some way prepare students for development after college? Can we relate change during college in moral development to change after college in Ego Development? Does performance in the curriculum during college relate to development after college? What range of questions do we put to the data, and how do we refine these questions for an integrated analysis strategy, when multiple staff are conducting analyses that raise their own questions? What are the better alternatives for investigating intra-individual change and inter-individual change? Who changes and why?

We are still assessing one issue that may be of particular interest to others embarking on a longitudinal study of college outcomes. By assessing the entire entering class, our population can be described as a sample of opportunity in relation to the examination of the influence of background variables on development. For example, because of the number of returning women in the college, we have a good distribution of age in our sample, and sometimes we have used this age variable as a theoretically significant surrogate for maturation. In our population, however, returning women differ in more ways than just age. We are still working on ways to better unconfound the variables in our sample, and although we expect some success in this, we also expect that there will limitations on how well we can unconfound some of these variables. One of our tasks is to find better ways of displaying as well as investigating the meaning of the background differences in our population. Nonetheless, the heterogeneity of the sample, particularly with respect to age, can contribute to a life-span view of development.

In sum, the analysis of the battery of human potential measures enables us to paint a broad picture of the development of women across ten years, from entrance to college, to five years after college. We have linked some of the changes during the student years to the curriculum. This broad picture of development increases faculty understanding of their students, and provides a framework for how they think about their teaching. But, faculty are also interested in more specific relationships between their teaching strategies and student learning. The broad picture of development provided by the human potential measures does not address these specific relationships. The next section will discuss longitudinal interviews of these same students. These longitudinal interviews have illuminated specific teaching and learning outcomes, and the relationship between them. So, while the human potential measures are able to show the broad effect of the curriculum, the Perspectives Interviews are able to show how specific teaching strategies are related to development.

EXAMPLE II: SELF-SUSTAINED LEARNING AND DEVELOPMENT

Synopsis

Deborah Deemer presents descriptive patterns of students' perspectives on their learning, growth, and development from longitudinal interviews in relation to curricular causes as attributed by students. Teaching and assessment methods that facilitated learning and personal growth generally validated faculty understanding of their practice. These include feedback, modeling, instructor attention, self-assessment, practice, and opportunities to integrate abilities. The description of students' development in understanding the use of criteria in self-assessing performance has resonated with faculty experience. Alumnae show more sophisticated learning patterns than students. Two-year alumnae have demonstrated different strategies for balancing family, work, and educational responsibilities, which appear useful for student services personnel. Patterns of learning confirm Kolb's (1984) theory of experiential learning. Developing ethnographic and other qualitative methods to analyze student perspectives interview texts is challenging, but likely to have long-range benefits for understanding how students experience curriculum, internalize and act out of acquired outcomes during and after college.

SELF-SUSTAINED LEARNING AND DEVELOPMENT

This section provides an example of longitudinal analysis of change studies that demonstrate relationships to the curriculum using student and alumnae interviews. It points to contributions already realized as well as potential contributions (Figure II-1). Realizing future contributions will challenge us to grapple with a number of unresolved issues.

Contributions

The use of confidential, indepth, longitudinal interviews of students and alumnae contributed to validation of the curriculum, provided feedback on faculty practice, and was used to develop a student learning inventory that gives beginning students feedback about their strengths and weaknesses as learners at Alverno and about faculty expectations. These benefits, which speak to the value of conducting interviews, is a finding that could be useful to others interested in studying student and alumnae outcomes. How faculty and Office of Research and Evaluation staff collaborated in the use of findings from the interviews might also contribute to the thinking of others working in institutional assessment.

Findings about aspects of faculty practice that facilitate self sustained learning and development contribute to the knowledge base of educational research. Domains of meaning (see Figure II-2) we are using in an analysis of the alumnae interviews hold the promise of future contributions. Aspects of the curriculum and faculty practice that facilitate growth in human potential will provide an additional contribution to the adult development literature. The evolution of a method to analyze the alumnae interviews and revisit interviews from the college years might stimulate the thinking of other researchers in college outcomes assessment (Deemer and Mentkowski, 1990).

Sample

Between 1976 and 1981 a random selection of students from the entering classes of 1976 and 1977 were asked to talk about their educational experiences at Alverno at the end of each college year. These same individuals were interviewed as five year alumnae. Longitudinal interviews are available from 99 students; 71 participated as alumnae. There are 73 participants who completed at least four interviews; 51 completed all five interviews. The interview was also conducted with a cross-sectional sample of 32 alumnae from the 1978 graduating class.

The interview method

The primary purpose of the Perspectives Interviews is to give our students and alumnae an opportunity to speak for themselves about their educational and post-college experiences. The interviews provide a window into how the student is constructing the learning process, responding to it, and to what she attributes her own development and learning. Faculty can then make a judgment about whether the student's construction of the curriculum is what faculty intend it to be, whether faculty and student constructions become more or less attuned over time, whether a student is developing a surface or indepth understanding, and what facilitates emergent common, unique, and internalized understandings.

Figure II-1. **Understanding student and alumnae development and contributing to college outcomes research and theory through student and alumnae perspectives interviews (PI's).**

DYNAMIC INTERPLAY OF PRACTICE AND THEORY

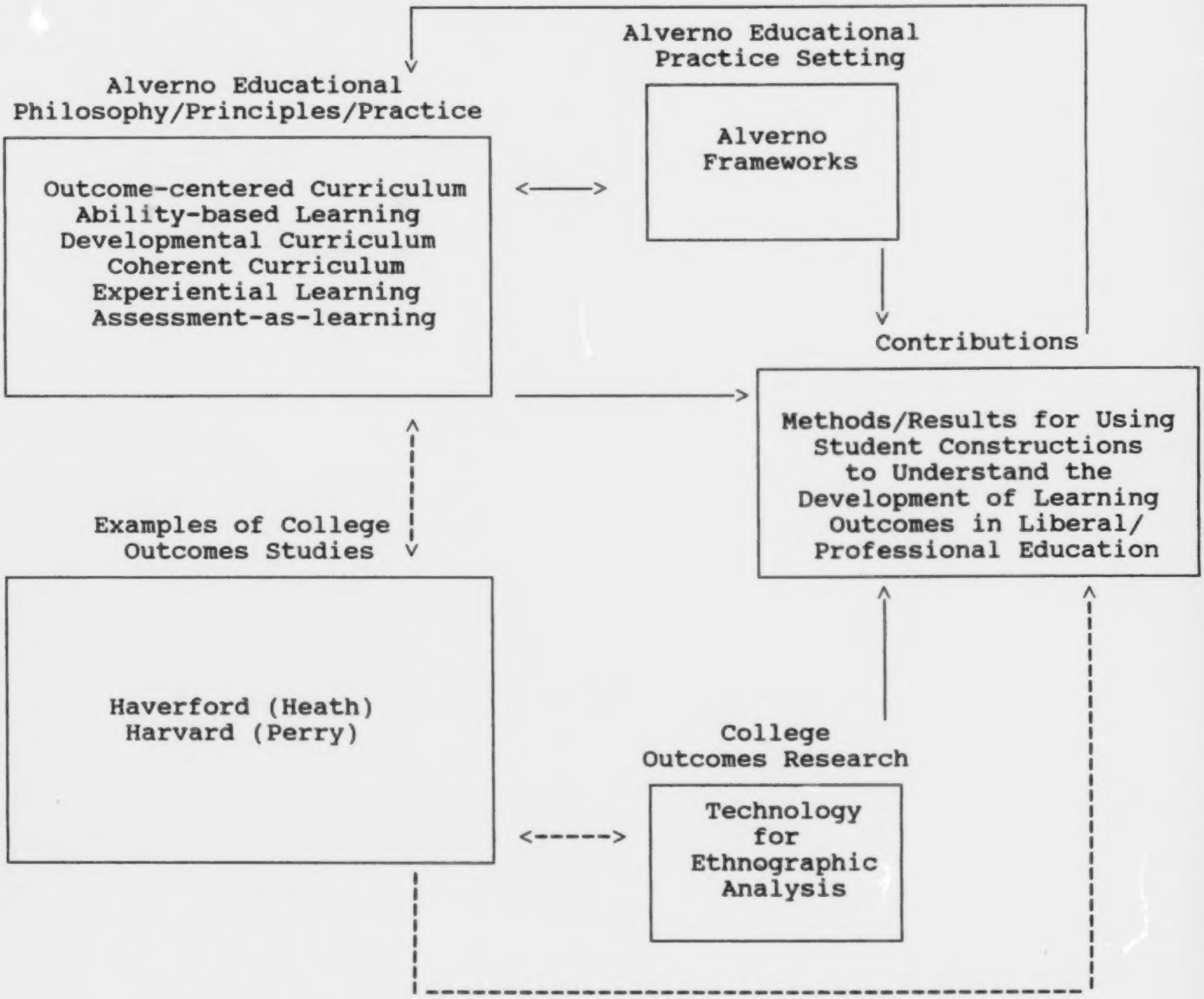

Alverno Educational Practice Setting
Alverno Frameworks
Alverno Educational Philosophy/Principles/Practice
Outcome-centered Curriculum
Ability-based Learning
Developmental Curriculum
Coherent Curriculum
Experiential Learning
Assessment-as-learning
Contributions
Methods/Results for Using Student Constructions to Understand the Development of Learning Outcomes in Liberal/Professional Education
Examples of College Outcomes Studies
Haverford (Heath)
Harvard (Perry)
College Outcomes Research
Technology for Ethnographic Analysis

Figure II-2. Projected domains of analysis of the student/alumna perspectives interview approach.

DOMAINS OF MEANING

	ABILITIES	> OUTCOMES
LEARNING	Self-sustained learning Self-assessment	Adaptability/ flexibility Integration
PERSONAL/PROFESSIONAL DEVELOPMENT	Self-reflection Self-confidence Self-definition	Identity Integration Commitment

THEMES ↔ **CONTEXTS** ↔ **THEMATIC PATTERNS**

THEMES

- Around what domains does she construct meaning?
- How does she make relationships or attribute causality
- How does she evaluate in relation to her own standards?

CONTEXTS

Participants' Characteristics and Situations

Coherent Curriculum

Supports and Hindrances Now

THEMATIC PATTERNS

- What thematic patterns illuminate the continuities/ discontinuities of development toward realization of identity, adaptability/ flexibility, integration, commitment?
- What thematic patterns illuminate development in relation to contexts and causes?
- How do these patterns relate to external descriptions of development toward realizing her human potential?

Each interview provides an independent, external judgment regarding the curriculum's validity and offers information about what, from the student's perspective, is working in the curriculum and what could be improved. How the students' construction changes over time provides evidence about the outcomes of college.

The alumnae interviews provide information about how these constructions are transformed after college. They also give us insight into the settings and life events our students confront after college; what life has demanded of them and whether college learning and abilities have been useful in helping them meet these demands. In the last two weeks we learned that ego development changes after college. It will be fascinating to examine what contributed to this change, and for whom. Can we link changes in college on some other domains to changes after college on ego development?

Findings from interviews during the college years

The focus here is on findings from an analysis of interviews conducted at four points, at the end of each year in college. The results of the interview analysis are rather extensive. A fuller description of the findings for the first four data points are provided in Much and Mentkowski (1984). For our current purpose a few broad findings from their work are highlighted with an example of how these findings were infused into Alverno practice.

Much and Mentkowski report that students differed in how well they grasped the overall purpose of the curriculum and it's relevance to their personal and professional goals. This difference was related to a more general ability to reason, infer and make relationships between the abilities taught toward by the faculty and how students used them in and outside class, on and off campus. The number of students who constructed relationships among abilities taught by the college and their performance in both personal and professional aspects of their lives increased over the college years. More advanced students had a better understanding of how their learning experiences made sense in terms of what the college and the student were working to achieve.

Student constructions of the learning process reveal a developing understanding of the role of criteria (which are behavioral descriptions of performance students and faculty use in assessment of individual work) (see Appendix C). Beginning students were apt to construct criteria as vague and arbitrary standards beyond their control. The criteria were understood as too explicit or "too picky" directions for how much content to learn to "pass". As they progressed students saw criteria as pictures of the abilities to be performed. Later they saw criteria as open to interpretation and providing a framework for feedback and self-assessment (see Appendix D).

The ability to use criteria to evaluate their own performance, i.e., to self-assess, plays a central role in the student's ability to engage in independent learning and development after college (Mentkowski, Much & Giencke-Hall, 1983). Students became increasingly capable as independent learners as they worked within the curriculum (Figure II-3).

Also during college, students developed a better sense of how they learned, and how they thought about learning. At the same time they became aware of and began to use diverse ways of learning.

Of particular interest to the faculty, students identified aspects of faculty practice that helped them in these three broad areas of their learning: making relationships, taking responsibility for their learning, and become increasingly capable in a multiplicity of learning approaches (Figure II-4). Excerpts that illustrate the evolution of students' thinking on these domains are provided on Figure II-5.

Utilization of the findings

Faculty interpretations of these findings played a role in the development of a learning inventory used in the orientation of first year students, i.e., The Student as Learner Inventory. The history of the development of this instrument and both faculty and student response to its use is described by Rogers (1988).

In brief, Assessment Committee members and Office of Research and Evaluation researchers used student constructions gleaned from the interviews in the creation of the inventory. The whole faculty had spent time thinking out loud about characteristics demonstrated by advanced students and were working on a set of characteristics to depict beginning and developing students. This data was brought to bear to create a picture of faculty constructions. The combination of student and faculty constructions shaped the inventory.

While faculty historically meet at particular moments in time to move forward certain aspects of their work, they bring to their conversations understandings of their students drawn from a myriad of interactions and sources. Development of the Student as Learner Inventory was no exception in this regard. As faculty were formally and informally gathering to develop pictures of their students' evolving understanding as learners, interview analyses brought to the conversations, findings about changes in student constructions observed in the interviews with students over their four years in college.

Out of this team work, research staff developed rating forms that integrated what faculty had already articulated with statements generated out of findings from student interviews. Faculty used these forms and provided feedback not only about technical aspects of the scales but also ensured that their educational philosophy was infused in the instrument's design (e.g., persisting until the forms were written in a way that would make it possible for them to provide feedback to students). The product of this collaborative work is the current version of the Student as Learner Inventory which is used to orient students and which is still revised based upon practice.

Figure II-3. Self-sustained learning in students.

Learning is:
- Experiencing
- Reflecting
- Forming new concepts, and
- Testing one's judgment and abilities in action

Figure II-4. Student learning outcomes and their causes as attributed by students.

Student Attributed Cause	Student Outcome
Instructor attention and empathy Feedback, Self-assessment	Taking responsibility for learning
Experiential validation Instructor coaching Professional application Integration of abilities	Making relationships among abilities and their use
Practice, Feedback Modeling, Peer learning	Using different ways of learning

Mentkowski, M. (1988). Paths to integrity: Educating for personal growth and professional performance. In S. Srivastva & Associates, Executive integrity: The search for high human values in organizational life (pp. 89-121). San Francisco: Jossey-Bass.

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Figure II-5. **Student perspectives on their learning during college: Excerpts from beginning, developing and advanced students.**

MAKING RELATIONSHIPS

BEGINNING	DEVELOPING	ADVANCED
I think sometimes the students miss the whole idea of what's behind the CLU's. They just do the paper work because it has to be done and they don't really sit down and say, I'm doing this paper because it's supposed to help me realize analysis or it's supposed to help me realize my values. They just do it to get the paper done. That's one of the major things I can see but yet at the same time it's hard to say if it really exists. I can't read into other people's minds and say are you really thinking of the concept or are you just thinking about getting it done.	... the analysis and problem solving, I've been doing all my life ... But you're not really aware of all the things you do, and once you are aware of each part I think your skill is sharpened and more easily used and applicable to different situations. CLU's that compare, like science and art, your Arts and Humanities CLU, I think that was really important because I don't think I really looked at all the different aspects of art and tried to compare my values to someone else's values. Even though we're in the same society, our values are different and I don't think I really was aware of that before.	They've asked me to see things in creative ways and to look at something differently and I wasn't able to do that very much before. I guess I kind of fell into a pattern and saw things one way or another way ... So it has caused me to take things and see them from many different point of view and that's challenging because it's much easier to say I'm a psychology minor and I'm interested in psych and if I'm going to look at a person's values I'm going to look at what's in their head. To try to get values out of a biochem experiment or something, that's challenging. So looking for relationships in a lot of things and looking for universality where there seems to be none is really hard on your head, it really is.

ROLE OF CRITERIA

BEGINNING

I like situations where I am told exactly what to do. That's another thing I had a hard time getting used to here, was that I'd say how long should this be, and they'd go well as long as you feel is necessary. Well what's that, a paragraph or a page? They give you criteria for what you have to do but you're never sure if you are meeting it all. I live in fear of leaving one out.

DEVELOPING

Like your valuing, your social interaction all this, they have general rules and first you spot them somewhere and then you have to apply them and people are watching you. You know, you're assessed, it's like you have to do it. Well after awhile I've incorporated many of the things into my own life ... you were forced to do it and now you're kind of doing it automatically ... like now I have critical incidents ... and it's like you make your own general rule but look out to see if you are doing valuing, are you doing social interaction, are you doing problem solving. So then because of that I have the rules internalized ... (W)hen it happens in a situation I can think, oh yeah, I did it. And then I go home and sit and write out what I did, what Alverno says you should do and then compare it.

ADVANCED

... my change in learning was probably from a memorized approach to an application approach. And I think that to an extent the, looking at the learning process it's shifted in a similar manner. Like from the letter of a law to the spirit of the law kind of approach. Now that's kind of vague but I think in the lower level competencies ... what I did for each project was probably very dictated and in a sense bounded by what the criteria said. You know, the criteria says you have to do this ... it gives you specifically what you have to do and I did it word for word, you know. It says now compare, so I compared. It sort of structures what it is you're doing. Now that I would kind of parallel with the memorized kind of approach. As I move into the upper levels I think that I was aware of more flexibility within those criteria outlines. For example, in an upper level project that I completed this semester, I was suppose to ... do ... a comparative analysis and then compose a code that would ... take into account research in a given area. Like how should researchers in a specific area relate to their clients and to the public and all that and compose a code that dictated that. Well after doing the comparison ... my analysis led me to the conclusion that a new code wasn't necessary ... (A)ll that ... researches in that area needed, was to apply the code that existed ... and that was my statement and I didn't compose my code as I probably would have, you know, awhile back ... I'm trying to set up a parallel and I don't know if it's particularly clear, but I guess the basic structure of it is moving from that letter of the law kind of approach to the spirit of the law kind of approach ... I realize that this ... criteria or this statement wasn't set in stone and that given my conclusion ... I didn't have to write that code. That my analysis led me to ... make another conclusion ... in going throught the process I think you become aware of the fact that those criteria are not set in stone, that they are flexible. And that the way a given criteria was outlined, how to do something, is not the only way to do it ... and then ... a lot of things open up for you, it's a lot broader ... spectrum you can pursue in terms of learning.

WAYS OF LEARNING

DEVELOPING

... I always thought college was, you sit in a room and you read a book and if you can memorize everything, its pretty good, you pass your tests, no problem. Well it takes a little more than that here. You have to use your head a little bit more. You have to be able to reason and solve problems and all that kind of thing, which is more than just memorizing. It's harder because I can sit there and memorize for a test, and memorize and memorize and know it all, its all down there, and then when it comes to the test I have to be able to take all that memorization and apply it to different things, and I can't always do that, and to relate, sometimes its really difficult.

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ADVANCED

... you ought to have a major background of all different theories and then when a situation arises ... choose from that background which one you are going to follow, that is what I see this as. I have been taught all these different ways of being able to learn and being able to demonstrate what I have learned and I evaluated each one ... and which one I am better at and stuff like that. When a situation does arise I'll be able to say this is what I am going to use or this is what I need to work on in this situation.

I'm always looking for ways to do my CLU's ... And when I approach a subject I look at how am I going to do this CLU? And then how is what I am learning in the lecture or lab going to aid me in doing this or performing this certain behavior which I have to be able to do. Writing a paper or finding values in scientific articles or what ever it would be, I'm always looking for ways of how am I going to do this? Before it was just studying for a test, but now you are constantly reading a book or reading an article or listening to a lecture to aid you with doing performance. Because later on, after I graduate, I'm not going to be able to take a test and give it to the patient. You have to be able to do certain things and just talking or working with your fellow employees in your own life, there are certain things that you have to be able to demonstrate every day.

So I think I've learned a great deal through the other people, teachers, when they are helping me specifically or other students, when you sit down and talk to them. Because you can learn a lot more. You can get a lot more perspective rather than just reading from a book. Because there are a million ways to look at something and if there is a continuing education student in one of your courses ... right now ... an example comes to mind because we just finished with a childhood sequence in nursing. And so the women who have had children, they can help you too. So it's like you've got a teacher, a nurse who is a teacher, she can give you experiential advice or views, and then you also have a lot of students who are mothers themselves and you also have students who are sharing the common experiences that you are. You can share them together and you're getting a lot more points of view rather than just sitting and not talking about what you are learning.

In response to an open-ended statement added to the inventory, "What did I learn about myself as a learner by taking this inventory" (N=80) almost all students felt they either gained insight into or reaffirmed their view of their strengths and weaknesses as a learner. Most said they were prompted to think about independent learning or about using feedback more effectively. Many wrote about how they would apply what they learned about themselves as a learner to their course work or personal relationships.

Unresolved Issues: An evolving method for analysis of the alumnae interviews.

Faculty perspectives have been useful in the evaluation efforts of the office and provide substantive contributions to the understanding of adult learning and development. The process by which knowledge is arrived at and the character of the findings are somewhat different than those derived by researchers working within a particular theoretical or discipline based framework. This section addresses the experience of one researcher working within the evaluative context of Alverno and hopes to illuminate what happens when discipline based research gives way to faculty theory in practice.

The researcher primarily responsible for the analysis of the five year alumnae Perspectives Interviews has commitments to developmental psychology as a discipline and is eager to begin an emergent analysis that would empirically identify associations between growth in human potential and experiences, orientations and interests revealed in the student and alumnae interviews. Barriers to movement on this project have been generated by the need to reconcile both methodological and value perspectives.

A central methodological issue we confronted was how to reconcile conflicting ideas about the importance of keeping blind to alternative data sources. So for example, one perspective holds that aggregate findings across participants completing the same instrument should be "independently" derived and analyzed before we empirically search for relationships across the data sources. An alternative view is that in examining information generated by individuals across the data sets, meaningful relationships will emerge. The importance of these relationships could not be initiated by researchers working solely within one data source.

A related issue arose from a desire to have staff who were working with different data sources begin their initial analyses with information from the same participants, i.e., to use the same sample. In this way we could work towards an initial pilot study and preliminary presentations that would reflect the integration of different strands of student development and abilities. Some staff wanted to use a random sample so, for example, they could minimize the effects of rater drift. Other staff preferred to hand pick an initial sample that would ensure a developmental dispersion. Splitting the data into "exploratory" and "confirmatory" subsets helped, but did not resolve the issue.

But as we developed procedures that, while cumbersome, would move us beyond these methodological issues, it became clear that other less articulated concerns would need to be addressed before this project could move forward. More specifically, the college has been engaged in an emergent understanding of their practice. While faculty are well read in their fields and draw on discipline based theory, the evolving practical understanding of the faculty can't be viewed from the lens of any particular extant theory. Analyzing the interviews out of one discipline perspective, such as moral judgment research, was thought to provide too narrow a focus for the study. The question became, "How do you use the understandings of a pluralistic, multicultural, and interdisciplinary faculty as a theoretical base in the analysis of interview texts?"

In our current plans for the Alumnae Perspectives Interview analysis we opted to have the Director of the Office of Research and Evaluation (ORE) provide a starter set of domains that integrate current faculty interests and prior research findings (see Figure II-2). The Director will participate in early interview analyses to help the less experienced researcher understand what is relevant to these domains. We also expect that new domains will emerge out of the data analysis. Feedback on the desirability of conducting an analysis in these domains will be provided both by the Director of ORE and faculty on the Research and Evaluation Committee.

It is clear that the value commitments of an institution provide boundaries around what is to be studied and helps to establish priorities. When we identify student outcomes and aspects of faculty practice related to growth in human potential both the college and the adult development literature will be enriched. But far more is provided in the interviews than is directly tied to faculty practice. For example, an analysis of interviews with two year alumnae yielded interesting ideas about how women integrate family and careers (Mentkowski, 1983). While this work is fascinating and made a significant contribution to the literature, it contributes much less to specific faculty practice and may provide little in terms of validating the curriculum. Faculty interest in understanding student lives goes beyond specific information about their practice. So we will not want to lose sight of information that illustrates how alumnae balance involvements in school, work, their families and in the community.

A method of efficiently gathering and organizing information would be helpful. We need a method that responds to questions most engaging of the faculty while simultaneously recording where data is available that will speak to future questions of interest. The ability to quickly pull information together will help us respond to the changing interests and needs of faculty. Advanced in computer technology for use in qualitative data analysis may be helpful in this regard.

Preliminary emergent findings will be reviewed by members of the college. Faculty and staff will help in our interpretation of what information is relevant to the domains and where we will most profitably invest our energies. By infusing understandings that faculty and staff have gained from their practice, the relevance, accuracy, credibility and usefulness of the findings will be enhanced.

EXAMPLE III: CAREER TRAJECTORIES OF WOMEN

Synopsis

Tamar Ben-Ur presents data from the questionnaires used in the Alverno Longitudinal Study. Colleges often use questionnaire data on students and alumnae to evaluate and improve their programs. This example demonstrates how questionnaire data can be used to give basic data on indicators of occupational attainment. In addition, this example discusses issues that arise around both the conceptualization and measurement of the careers of women. In this study, women's careers are analyzed for family, educational, and occupational aspects of women's careers.

Analysis of the questionnaire suggests that most alumnae are in professional or managerial positions commensurate with a college degree. Some non-traditionally aged women tended to remain, however, in clerical positions, suggesting that there may be constraints to career mobility for some non-traditionally aged women. Although questionnaire based data from college outcomes studies may shed light on women's careers in general, the questionnaire based data is most effective in providing internal reports to the college.

CAREER TRAJECTORIES OF WOMEN

The Perspectives Interviews and the Human Potential Measures contribute to an enlarged understanding of the trajectories of women's lives, learning, and development. The institution also has an interest in basic data on what alumnae career, family, and educational trajectories look like. Are they satisfied? Do they feel well prepared by Alverno across different activity areas and abilities? How many work? Do they work in a field related to their major? Do they experience occupational mobility? Are they currently in a higher level than they were when they entered college? Is there inter-generational mobility? Are they in a higher level position than their parents?

These questions address basic objectives that many students bring with them to college and that are included in the mission of the college: The personal and professional development of students. Are alumnae developing personally and professionally? So the example that we are giving you is showing data that were collected and analyzed to answer institutionally driven questions. The data primarily serve an institutional reporting function, and are less oriented toward contributing externally.

At the same time, because of the diversity of ages and backgrounds and the combination of liberal arts and professional majors, the results produced in this study have the potential to contribute to the knowledge base of adult development and college outcomes while they answer specific college questions.

We now share lessons learned and unresolved issues regarding the measurement and the description of career trajectories for women in the context of institutional reporting. Employment and family background data were collected through a variety of measures in the Longitudinal Study. Towards the end of the 4th year at Alverno, which for most students is shortly before graduation, the students were asked about their paid and unpaid employment before and while at Alverno. They were also asked about their expectations relating to their first job after college and about their career goals. Approximately five years after college, the alumnae were asked to indicate their primary activity (which includes paid employment, family, volunteer and self-development). A number of questions probed in more detail employment and education since graduation, the abilities which alumnae perceived as important in current employment, the preparation they received at their college and satisfaction with their primary activity.

Employment and Mobility

For our five year alumnae, we learned that 95% were currently employed. Given that most of the alumnae continue to work, other questions followed that help interpret employment characteristics in terms of the college's concerns.

> NOTE: For our current analysis, we used the 1980 census-based major occupational groupings suggested by the U.S. Department of Commerce. We collapsed the 13 major categories into three basic categories based upon the mean socio-economic scores for each of the 13 categories (Stevens and Cho 1985). We did not use the socio-economic scores assigned to the 1980 census-based occupational codes, since existing census job specifications are

ineffective in describing the myriad of job titles used by our participants, especially in management and management-related occupations. They also do not provide directions for coding part time jobs.

- **Are Alverno graduates in a higher status positions than their parents? To what extent has there been inter-generational mobility?**

While some colleges may not ask this question, the mission of Alverno includes meeting the diverse needs of women of varied economic circumstances. The majority of our students are first generation college students and more than half of them come from blue collar families. In particular, non-traditionally aged students tend to come from lower socio-economic status. However, since the majority of alumnae are in professional or managerial positions, current job classification of the participants is not related to their parents' job classification.

- **Are they currently in a higher level position than they were upon entrance to college?**

This addresses the extent to which non-traditionally aged women improved their socio-economic status following graduation. For the non-traditionally aged women, there is some preservation in occupational category before and after Alverno. Non-traditionally aged women may face some barriers to pursuing or making career changes after college, while traditionally-aged students seem to be more effective in beginning their occupational careers. (85% of the traditional age group who are employed at Time 4 vs 76% of the older groups are currently in professional/management related jobs.) It appears that some older women stay in clerical jobs.

- **Are Alverno graduates generally employed in positions that are commensurate with a college degree?**

None of the graduates is in a blue collar position five years after graduation. Seventy eight percent of the participants are employed in professional and managerial positions that usually require or at least prefer incumbents with a college degree. Only 17% are in sales and clerical jobs category that was the modal category for the pre college students.

Perceived Preparation By Alverno And Job Satisfaction

Perhaps because, Alverno has an ability-based curriculum, faculty and staff are particularly interested in the alumnae level of ability and satisfaction on the job at least as much as they are interested in their mobility. To answer these questions, we identified 25 abilities which we believed are essential to efficient performance of a variety of jobs and which we believed the college attempted to develop. We asked the alumnae how often each ability is required by their job and then to indicate how they think their abilities compare to the abilities of others who are engaged in the same or similar job title. Table III-1 reveals that all the abilities we selected are perceived by the alumnae as required on their jobs at least sometimes. Evidently, some abilities are perceived as required more often than other. The table also show that participants tend to perceive their abilities as strong or stronger than the abilities of other people in the same position. We correlated the 25 pairs of ability variables.

All 25 correlations were significant ranging from .15 to .56 (Table III-2), supporting the conclusion that our alumnae feel confident and competent on their job.

Our survey showed a very high level of job satisfaction with first job after Alverno. Participants tended to believe that their jobs are consistent with their abilities and that they have a chance for mobility. However, these levels as reported by alumnae are lower than their expectations at graduation, and a small number of alumnae were dissatisfied with their first jobs.

In general, alumnae rated their preparation at Alverno highly. It is interesting to note that the college was ranked higher in providing "potential for growth," "preparation for higher education" and "life long learning" than for preparation "career and economic growth."

Analysis Across Domains of Life Trajectories

Many of our research questions are raised through interactive discussions among research staff and faculty. As our staff attempted to create more sophisticated trajectories of our graduates several concerns were raised about how we were going to conceptualize and measure women's career trajectories. These discussions can be emotional because we engage not only a myriad of disciplines and Research traditions, but also a variety of personal beliefs. A major question that led to many others was: What types of career related outcomes are we interested in measuring and how will we measure them? Are we to adopt the status attainment model and measure our success as educators in terms of the level of socio-economic status or social prestige attained by our alumnae? Some staff members have had serious reservations regarding the use of socio-economic or prestige indexes as valid measures of occupational achievement of women, because of disagreement with the assumptions that underlie its construction.

We all agreed that level of socio-economic status is, by itself, an insufficient measure of personal achievement. Indeed, our research design is based on the assumption that college outcomes in terms of alumnae activities can be expressed in various combinations of alumnae achievements. Part of our study involves an attempt to identify broader career or life patterns that include in addition to paid employment, taking care of family, volunteer work, pursuing further education and personal development. From this perspective, a "Mommy Track" is a fine track if the alumnae chooses to invest less in the job and more in the family, even if it means less opportunity for promotion.

Family: This concern about representing other domains of life trajectories for women is confirmed by the self-descriptions of the alumnae women. Given that 95% of our graduates were employed - 76% full- time and 19% part- time, the fact that 75% chose paid employment as the primary activity that consumed most of their time is hardly surprising. However, it is important to note that women who work full-time outside the home, do not necessarily see paid employment as their primary activity. Among women who worked full time, 6% indicated family was their primary activity, 2%; indicated education as a primary activity, and 2%, indicated some other activity as primary. Even more striking, is the data for women who have part-time paid employment: Only 29% perceived paid-employment as their primary activity, and the majority (63%) chose taking care of family as their major activity. We found a strong correlation ($r=.52$; $p \angle .001$) between having preschool children and not working full time. This in large measure will probably explain why the allocation of time between work and other activities, in particular family, tend to change for the same women across the interval. Approximately 16% of the alumnae did not work continuously for the five years after college, although only 1% have never worked. There were also distinct differences in these patterns. Five years after Alverno, 17% were working part time, but only 8% had continued to work part time throughout the entire alumnae interval. An additional 22% combined full- and part-time work throughout this period.

Continuing Education: Continuing education is also an important activity area for our alumnae, which is what faculty would expect. As many as 51% of the alumnae reported some kind of educational activity. This commitment to continued learning includes both formal and informal educational activities. Overall, 38% see themselves as taking advantage of continued opportunities for continued learning to a great or very great extent. Women who have paid employment are more likely to perceive themselves as taking advantages of opportunities for continued learning, ($M = 3.32$ versus $M = 2.82$). Turning to formal education, five years after graduation, 11% of our participants have completed a post graduate degree and 9% are currently enrolled in graduate school. We found, as expected a relationship between having a higher degree and a supervision position and between the latter and salary level. Thus, the occupational and educational trajectories are connected.

Future Plans, Contributions and Unresolved Issues

Our plans for developing a more sensitive measure of occupational mobility include using the participant's own report of further education and salary level, as well as her report that promotion was a reason for movement from one job to another. We plan to integrate all of these sources into categories of career trajectories, through a process that will rely heavily upon the coder's expert judgment. We are aware, however, that Job titles, full-time/part-time status, salary category, highest degree obtained, and other such questionnaire variables do not fully enable a precise description of career trajectories.

Also, as we move into our more in depth analyses, we need to examine career trajectories for specific professions and major fields in order to have a greater opportunity to impact faculty understanding of the occupational careers for students in their major so that they improve curriculum.

Finally, a major question is how well we will be able to represent family, education, and other activities that elaborate the existing paid employment career trajectories.

To sum up, the questionnaire-based component of the Alverno Longitudinal Study of women may provide information that can contribute to better understanding different patterns of careers for women. We still have to explore appropriate measures of career achievement, that are more sensitive to changes in career that are too small to be noticed by a national occupation coding scheme, but still too important for the individual alumna to be overlooked. If successful, this would assist in describing college outcomes for women, in a way that could be of interest to external audiences.

Nonetheless most of the immediately identifiable benefits apply to the campus. For example, the study can facilitate an on-campus understanding of the relationship between alumnae perception of abilities and college preparation.

As we look forward to the analysis of alumna abilities, we recognize that we move even further into an analysis of the intersection of women's public and private life. According to Burbridge (1990), women have increased responsibilities in the labor market, but this has not been followed by concomitant decreases in family responsibilities. What kinds of abilities characterize professionally successful women? Do similar abilities emerge in personal life, and if so, what are the key abilities that enable women to better deal with their multiple public and private responsibilities?

Table III-1

Mean and Standard Deviation of Perceived Frequency That Ability is Required on the Job and Strength of This Ability Compared to Others

Ability	Frequency		Strength	
	Mean	SD	Mean	SD
o Listen and respond to the concerns of others	4.63	.59	3.80	.74
o Project self confidence	4.42	.59	3.57	.89
o Think systematically and logically	4.39	.64	3.76	.73
o Know when and how to get information	4.34	.67	3.72	.89
o Demonstrate flexibility when unanticipated events arise	4.28	.70	3.92	.77
o Understand the complexity of situations	4.27	.71	3.69	.78
o Take on challenges	4.20	.78	3.90	.85
o Communicate effectively in writing	4.15	.85	3.84	.94
o Be open and receptive to different points of view	4.15	.73	3.71	.89
o Take charge quickly	4.15	.91	3.79	.87
o Organize resources and people to accomplish tasks	4.14	.92	3.83	.78
o Express/control emotions appropriately	4.12	.80	3.84	.79
o Provide leadership	4.12	.98	3.77	.81
o Express opinions effectively	4.10	.66	3.55	.80
o Consider a range of alternative or creative approaches	4.08	.84	3.72	.82
o Maintain systematic thinking in pressure situation	4.06	.69	3.73	.71
o Share expertise (e.g., teach, coach)	4.04	.92	3.81	.84
o Work cooperatively in groups to accomplish goals	4.02	.92	3.68	.76
o Initiate action beyond what is called for	4.01	.85	3.89	.91
o Address conflict directly and tactfully	3.91	.80	3.49	.91
o Implement plans to achieve long-term goals	3.82	.92	3.45	.86
o Understand and effectively use numerical data	3.63	1.01	3.40	.84
o Adjust performance based upon feedback	3.53	.86	3.47	.82
o Compete when necessary	3.34	1.06	3.29	.89
o Make effective oral presentations to groups	3.33	1.12	3.61	.90

Note: Frequency 5-point scale -- 1. not at all....5. very frequently
Strength 5-point scale -- 1. much weaker...5. much stronger

Table III-2

Correlations Between Perceived Frequency in Which Ability is Required on the Job and Strength of Ability Compared to Others

Ability	
o Organize resources and people to accomplish tasks	.56
o Initiate action beyond what is called for	.54
o Compete when necessary	.54
o Understand and effectively use numerical data	.52
o Take on challenges	.51
o Take charge quickly	.50
o Be open and receptive to different points of view	.50
o Understand the complexity of situations	.47
o Make effective oral presentations to groups	.46
o Provide leadership	.45
o Know when and how to get information	.45
o Communicate effectively in writing	.45
o Implement plans to achieve long-term goals	.43
o Address conflict directly and tactfully	.42
o Express opinions effectively	.41
o Consider a range of alternative or creative approaches	.41
o Demonstrate flexibility when unanticipated events arise	.41
o Project self confidence	.40
o Share expertise (e.g., teach, coach)	.39
o Work cooperatively in groups to accomplish goals	.38
o Maintain systematic thinking in pressure situation	.32
o Adjust performance based upon feedback	.32
o Listen and respond to the concerns of others	.29
o Express/control emotions appropriately	.28
o Think systematically and logically	.15

Note: For r _\ .28, p/_ .001; For r=.15, p /_ .05.

EXAMPLE IV: ALUMNAE GENERIC ABILITIES

Synopsis

Glen Rogers and Mary Talbott describe professional abilities in dynamic performance settings. Their work builds upon job competence studies of outstanding versus average professionals, some of which have been conducted at Alverno (Mentkowski, O'Brien, McEachern, and fowler, 1982; Deback & Mentkowski, 1982). The Behavioral Event Interview technology that they are reporting on may be useful to other college's who are interested in better understanding the abilities of their alumni. Working out of a college outcomes framework, they are developing a codebook of alumnae generic abilities, and are contributing to a taxonomy of abilities required by ill-structured post-college settings. They suggest that the dynamic interplay between the research goals of college outcomes studies and the existing research and methodology for studying abilities will lead to new knowledge. Initial results suggest that effective alumnae performance is distinguished by being efficient and having a positive influence within a broad organizational context, including the development of others.

ALUMNAE GENERIC ABILITIES

Introduction and Background Information For Describing the Potential For Research and Practice Contributions

Our work with the Behavioral Event Interview is focused on the study of abilities in ecologically valid settings, where the definitions of the problems or tasks being confronted are to a large measure defined by the participants. The tasks or problems that the participant is confronting are largely ill-structured. Abilities such as ego-strength, proactivity, problem finding, and organizational strategizing are the topic of study. Numerous methodological issues and difficulties must be confronted as we try to take on this task, but we have been led to take on this task of studying these kinds of abilities in the way that we have by the evaluative goals of our college outcomes study.

We hope that by showing how our research is influenced by our setting in a particular college outcomes study, we can make a case for the potential of college outcomes studies to contribute to conceptualizations of college-level professional and personal abilities. In addition to this potential for contribution to research on abilities, we expect that other colleges conducting college outcomes studies may find the Behavioral Event Interview technology that we are using useful for identifying their alumnae outcomes. For example, on our own campus we believe that this methodology will contribute to faculty understanding of which alumnae abilities distinguish effective performance and, thereby, contribute to faculty constructions of their curriculum goals.

We added the Behavioral Event Interview to the battery of measures used in the alumnae follow-up of the Alverno Longitudinal Study for two reasons. First, we wanted to be able to describe alumnae abilities across personal and professional domains with enough descriptive richness to impact the Alverno faculty's understanding of how alumnae are performing and what abilities they are using. Alverno faculty are interested in how well the abilities that students learn in the curriculum are manifested in their post-college performance. What do the abilities look like in post-college performance settings? Do alumnae transform and adapt their abilities? We needed a measure of alumnae abilities that had face validity for faculty, that was commensurate with faculty's performance-based understanding of abilities, and that was descriptively powerful (cf. Mentkowski, 1989; Mentkowski & Rogers, 1985; Rogers, 1988).

Second, we wanted a criterion measure of the effectiveness of alumnae performance after college. Such a criterion measure of post-college performance is intended to serve as a referent to performance on the human potential measures, and the gains on these measures that are attributable to the college curriculum. Such a criterion measure of post-college performance is intended to span professional domains, to include personal and volunteer activities. Alternatives such as salary and self-reported ratings seemed limited. How does one anchor self-ratings? How does one equate salary across professions, and what about volunteer work and family activities?

The construction of these measurement and description goals and how we are trying to carry them out are influenced by Alverno's educational philosophy and principles, as well as being influenced by psychological theory, and the range of methods available for identifying abilities (see Figure IV-1).

For example, Alverno's educational philosophy and principles include the educational assumptions that abilities are generic, developable, and holistic. We have attempted to construct a generic ability codebook in such a way that "the same" ability could be recognized and reliably coded in a wide range of naturally varying post-college settings, in part because abilities are conceived by faculty as transferable across disciplinary domains.

Because Alverno faculty are concerned with abilities that are developable, we have focused on the performance of the ability as the unit of analysis, and have not tried to characterize enduring personality structures.

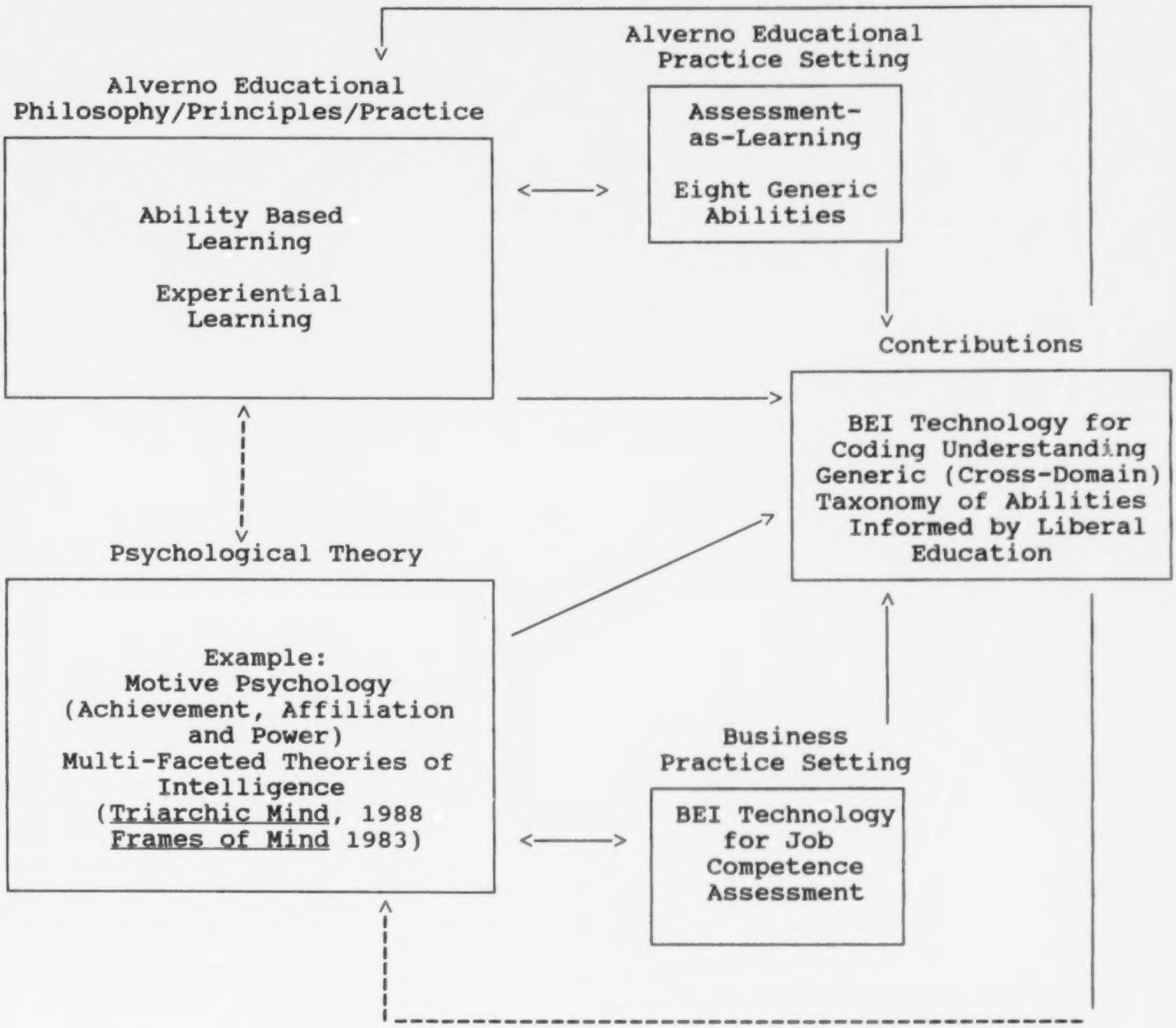
Because Alverno faculty are interested in developing abilities that are holistic, they design their assessments to assess abilities through performances that are sustained, interactive, open, complex, and dynamic. Holistic abilities have a behavioral aspect, a knowledge aspect, an affective aspect, a self-perception aspect, as well as a motivational or dispositional aspect. Our decision to study ecologically valid performances where the tasks are selected and defined by the alumnae, and where the tasks tend to be ill-structured is influenced by this conception of holistic abilities. Of course, the faculty's conception of abilities is already influenced by their understanding of what abilities will serve their students after Alverno.

The college includes a liberal arts component in its general education curriculum. Liberal arts values, such as sensitivity to individual differences, are included in the codebook as code categories. They are coded independent of whether or not they appeared to contribute to an effective performance.

Another consideration was the technology that was available to identify abilities. Not only did this methodology have to match the Alverno faculty's conception of abilities, but it also had to be feasible within the frame of the Alverno Longitudinal Study, of which it was to be a part. Direct observation of performance in post-college settings was not feasible, and it was not feasible to bring the participants back to campus for performance assessments, like an in-basket or set of simulations. The Behavioral Event Interview (BEI) provided an alternative -- a surrogate to the direct observation of performance. The Behavioral Event Interview was developed by management and industrial consultants as part of a Job Competence Assessment technology (see Figure IV-1).

Figure IV-1. Development of a discription of alumnae generic abilities through behavioral event interviews (BEI's).

DYNAMIC INTERPLAY OF PRACTICE AND THEORY


Alverno Educational Practice Setting
Assessment-as-Learning
Eight Generic Abilities
Alverno Educational Philosophy/Principles/Practice
Ability Based Learning
Experiential Learning
Contributions
BEI Technology for Coding Understanding Generic (Cross-Domain) Taxonomy of Abilities Informed by Liberal Education
Psychological Theory
Example: Motive Psychology (Achievement, Affiliation and Power) Multi-Faceted Theories of Intelligence (Triarchic Mind, 1988 Frames of Mind 1983)
Business Practice Setting
BEI Technology for Job Competence Assessment

Job competence assessment is a strategy for identifying abilities that distinguish outstanding versus average performers. The Behavioral Event Interview (McClelland, 1978) is derived from Flanagan's (1954) critical incident technique. The Behavioral Event uses a semi-structured interview to develop a detailed narrative account from the participant. The participants in this study selected six events from their self-defined primary and secondary activity areas where they felt that they demonstrated their abilities. The narrative account of the participant is probed by the interviewer for specific information on what led up to the event, what the participant herself did or said, what she was thinking and feeling at the time, who else was involved and how they were involved, and what the outcome was for the event.

Job Competence methodology uses the nominations by supervisors or peers of outstanding versus average performers within the company to identify what abilities distinguish outstanding versus average performance. This was not feasible in our study, so, we have focused on identifying outstanding versus average performances. We did this by using faculty judgments of the relative effectiveness of performances as a criterion for distinguishing which abilities contribute to more effective performances. This strategy not only was more feasible, but had the advantage of using the standards of one of our primary audiences, Alverno College faculty, as an anchor for what is considered effective performance for alumnae. Thus, the faculty's professional and liberal arts values are infused into the description of the effective abilities.

Although we have relied heavily upon the technology developed through job competence studies, we have also found the need to adapt this technology to our college outcomes research goals. In particular, the expectation that college learned abilities would transfer to a range of post-college performances and the need to develop a broad model of the development led us to adapt the existing job competence methodology to the coding of generic abilities. What has most attracted us to the Behavioral Event Interview is its capacity to elicit descriptions of ecologically valid and ill-structured tasks. This focus on ill-structured tasks (see Kurfiss, 1988) is something that we share with the management and industrial consultants using Job Competence Assessment technology. It is our belief that ill-structured tasks call forth high level abilities.

Our attempt to develop a generic ability taxonomy and coding strategy was also significantly influenced by psychological theories that focus on ecologically valid operant performances (see Figure IV-1). For example motive theories, (see McClelland, 1973; 1987; Winter, 1973; 1989) have influenced not only our attempt to code achievement, power and affiliation motives through the Behavioral Event Interview, but also, these motive theories have helped us conceptually organize the ability codes under the Entrepreneurial and Interpersonal Ability sections of the codebook (see Appendix F). For example Achievement Motive (Efficiency Orientation) is seen as underlying Proactivity and Efficiency Actions. Likewise, the Affiliation Motive (Concern With Affiliation) is an underlying support to Positive Regard, Sensitivity to Individual Differences, Accurate Empathy, and Development of Others.

Researchers studying cognitive abilities through operant methodologies have strongly influenced our conceptualization of how to code cognitive abilities. Some of these researchers have studied cognitive abilities through operant methodology because they are working in college settings like ourselves (Winter, McClelland, & Stewart, 1982), but most studied these cognitive abilities through an operant methodology because of the capacity of this methodology to identify abilities for training and selection in specific work settings (Boyatzis , 1982; Klemp, 1988; 1991; Klemp & McClelland, 1986; Sokol & Oresick, 1986; Spencer, 1983). George Klemp's work on defining cognitive abilities has been particularly influential, and his work can be related to theorist's such as Sternberg (1988) and Gardner (1983), who are conceptualizing multi-faceted domains of intelligence.

Understandably, some of the most influential prior work has been those professional BEI studies carried out previously by Alverno College. These include a study of nursing professionals (DeBack & Mentkowski, 1986) and management professionals (Mentkowski, O'Brien, McEachern, & Fowler, 1982). The management study (Mentkowski et. al., 1982) found that a coding strategy (McBer & Co., 1978) developed from a range of job competence management studies could also be applied to outstanding managers. The nursing study developed a code book of nursing competencies and found that these nursing competencies could distinguish baccalaureate from non-baccalaureate nurses.

In summary, the BEI Generic Ability Codebook that we are developing is being derived from a number of sources. Specific codes can be traced to a range of Job Competence studies (e.g., Klemp, Huff, & Gentile, 1980; Klemp & McClelland, 1986; Leles, 1968; Spencer, 1983), to an Alverno faculty teacher competence model (Diez, 1990), and to descriptions of abilities in Alverno's ability-based curriculum (Alverno College Faculty, 1976, revised 1985). Our goal has been to develop a generic ability codebook for the purpose of coding abilities across professional, as well as personal, activity domains. An overview of abilities that are being coded can be seen in Appendix F.

Our setting has influenced our research strategy in significant ways. It has led us to take on difficult research questions, and to study abilities that make a difference in how well alumnae perform. The taxonomy of college level abilities, infused by a liberal arts conception of the professions and personal life, is arguably a different area of study than is defined by existing research (see Figure IV-1). Job Competence technology is the closest methodology to our work, but just as Job Competence technology has been adapted to the needs of management and industrial consultant firms, so we expect that studies of college outcomes, because of their differences in purpose and settings, may lead to innovations in method, and the creation of new taxonomies of abilities.

Brief Overview of the Implementation of the BEI

Two hundred and sixty five Alverno alumnae were interviewed with the BEI. In each case, the participant was asked to identify a primary and secondary area of activity. She was then asked to think of times she felt effective (two in the primary area and one in the secondary area) and times when she did not accomplish what she was intending (two in the primary area and one in the secondary area). The cases were then placed in random order and that sequence was followed for writing up the interviews.

Approximately 60 cases containing 350 events were written up when the faculty validation sample was drawn. The completed narrative accounts were initially placed into one of 12 Activity Area categories: management, nursing, teaching, family, continuing education, developing personal skills and interests, volunteer work, technical professions, administrative support professions, customer service and related professions, artists, and nursing education. Collapsing categories resulted in six Activity Area categories for the faculty validation study: management; nursing provider; teacher; taking care of family; a range of direct contributors in personal and civic activities (developing skills and interests, volunteer work, continued education); and direct contributors in paid employment (technical professions, administrative support, customer service and related professions, performing artist). For the validation study, a second random sample of 60 events was drawn from a larger sample that had been randomly sequenced prior to being written up.

In each of the six Activity Areas, two different faculty were asked to make overall judgements of effectiveness of alumnae performances across ten events within a single Activity Area. Thus Faculty Raters were nested within Activity Areas. The ratings of the two faculty were combined and then collapsed into three categories so that approximately equal numbers of ratings of Most Effective, Effective, and Least Effective were created. The 60 events were coded by two independent coders blind to the faculty ratings, using a generic ability codebook developed for this study, and then consensus coded. Faculty combined ratings were crosstabulated with the consensus coding of each ability.

Initial Findings and Contributions

So far, during the code development stage Category Agreement (see Winter, 1973) is .64 when calculated at the level of 32 broad ability categories. Development of the coding process for the generic abilities involves extensive efforts at defining ability subcodes and categories. In contrast, faculty were asked to make judgments of the overall effectiveness of the alumnae performance without any appropriate description of what might constitute effectiveness. Inter-rater correlation between faculty judgments of overall effectiveness was clearly positive ($r = .39$, $N = 60$).

Only 31 events were consensus coded at this time for abilities. Preliminary cross tabulation of the combined faculty ratings against the consensus coding of abilities, yielded 6 of 28 abilities that were correlated statistically significantly with faculty ratings. Table IV-1 displays those abilities that appear to distinguish effectiveness of performances and Table IV-2 displays the abilities that do not appear to distinguish effectiveness of performance. No claim is made for the replicability of these results given the few cases that they are based upon.

As can be seen in Table IV-1, the performances rated as more effective by faculty were distinguished from less effective performances by Efficiency Actions, which involve the efficient use of time and resources. Another ability that influences effectiveness is Diagnostic Information Seeking, which might logically be an initial step. Effective performance is also related to an orientation to influence that includes the Use of Informational/Expert Influence and the Development of Organizational Power. The category of Development of Organizational Power can be coded for either developing organizational power through strategic personal contact or by showing an understanding of how the organization is functionally structured.

Faculty judgment of effective performance is not simply related to assertiveness and influence of the alumnae. Performance rated as more effective are also coded for the Development of Others and Positive Regard for others. This is consistent with our expectation that liberal arts values may inform faculty judgments of effectiveness. More generally, we have tentatively identified what distinguishes performances that faculty judge as more effective.

Taken together, the pattern of abilities that distinguish effective performance suggests a performance that makes a difference: it makes a difference by being efficient, and having a positive influence within the organizational context, including the development of others. This might be characterized as a conceptualization of influence within the organization, even though the more specific codes related to conceptualization and other kinds of analytic thinking were coded too infrequently to test this extrapolation.

Nonetheless, one of the benefits of this Behavioral Event Interview Methodology is that it generates highly descriptive demonstrations of what the performance of the ability means in context. For example, Appendix G shows an example of how Efficiency Actions, Positive Regard for others, and Developing Organizational Power are demonstrated in one effective performance. The write-up of performance represents the oral speech, and therefore does not conform to the conventions for written documents.

These ability codes displayed in Appendix G require some explanation. For example, Efficiency Actions was coded for two specific subcategories: Lines 11 through 19 show the nurse administrator stressing efficiency by balancing task requirements and the needs of the nursing personnel. Lines 19 through 45 were coded for identifying the constraint to implementing a new and "better" system for managing nursing activities, that is, she saw as a constraint on her planning -- the staff nurses had to have confidence in the new system in order to be motivated to enter the data. Positive Regard for others is coded (lines 109 through 120) for expressing respect for others who are perceived as different. She does this through her action of adjusting the talk to meet the needs of different kinds of health care professionals. Organizational Power is coded, in this case, for a subcategory that codes the alumna's action of seeking an opportunity to relate her work to the broader health care system. It should be noted that for each of these abilities other subcategory codes exist that were not demonstrated

It is this descriptive power, as reflected in Appendix G, that has led the college to use Behavioral Event Interview technology in a number of different studies. The descriptive power not only provides examples that faculty can use in their teaching, but also conveys to the faculty a clear understanding of what post-college performance and performance settings look like. This capacity for rich descriptions of performance leads us to expect that faculty will be able improve their teaching of students based upon the studies identification of key abilities for effective alumnae performance.

Table IV-1

Abilities Distinguishing Faculty Judgments of Overall Effectiveness By Frequency That Participant Abilities Were Coded

		Faculty Judgment of Effectiveness		
Ability Coded	Total Frequency Ability Coded	Least (n=11)	Effective (n=9)	Most (n=11)
Efficiency Actions	9	0	2	7
Development of Others	10	2	1	7
Use of Informational/ Expert Influence	10	1	2	7
Positive Regard	8	1	1	6
Diagnostic Information Seeking	6	0	1	5
Development of Organizational Power	6	0	2	4
All Above Abilities	49	4	9	36

Note. Table entries are the frequencies that the ability was consensus coded by two coders blind to the faculty ratings. This table includes data only for those abilities that were statistically significantly correlated with faculty ratings of overall effectiveness.

Table IV-2

Abilities Not Distinguishing Faculty Judgments of Effectiveness By Frequency That Participant Abilities Were Coded

		Faculty Judgment of Effectiveness		
Ability Coded	Total Frequency Ability Coded	Least (n=11)	Effective (n=9)	Most (n=11)
	Positive Abilities			
Accurate Assessment	15	4	4	7
Sees Alternatives	14	5	3	6
Concern with Impact	14	3	5	6
Initiative	13	5	1	7
Pattern Recognition	11	2	4	5
Reflective Thinking	9	4	0	5
Concern with Affiliation	8	4	2	2
Accurate Empathy	8	1	3	4
Self Control/ Emotional Stamina	8	3	2	3
Use of Socialized/ Political Power	8	3	0	5
Analytic Thinking[a]	7	3	0	4
Perceptual Objectivity	7	1	2	4
Reflectively Coordinated Practice	7	2	1	4
Sensitive to Individual Differences	7	1	2	4
Stamina	5	1	1	3
Efficiency Orientation	5	0	2	3
Specialized Knowledge	5	1	1	3
All Above Abilities	151	43	33	75
	Negative performance codes			
Negative Social Emotions	6	3	1	2
Lack of Commitment to Improvement	5	3	0	2
Inaccurate Self-Assessment	6	3	1	2
All Above Abilities	17	9	2	6

Note. The table entries are the frequencies that the ability was consensus coded by two coders blind to the faculty ratings. Abilities coded fewer than 5 times were omitted. This table includes data only for those abilities that were not correlated statistically significantly with faculty ratings of effectiveness.

[a] This category is coded if hypothetical/causal thinking, planning/systematic thinking or conceptualization is coded.

Unresolved Issues

The sample for the study spans across post-college settings and disciplines as they vary in the Alverno Longitudinal Study sample, rather than being selectively defined by a set of disciplines. This wide natural variation required us to create categories and subcategories of abilities that were abstract enough to capture the essence of an ability and, yet, concrete enough to allow us to reliably code functionally equivalent, yet contextually different, manifestations of an ability. Demonstrating that our judgment that, although manifested differently, an ability is the "same" presents a challenge. Correlating the BEI with the Human Potential Measures presents only a partial solution, and relies upon the assumption that these measures are an adequate criterion.

This challenge of trying to code a wide range of abilities across domains has led to initial difficulties in getting reliable coding. Given the cross domain coding, we are not sure what reliability we can get, nor even what would be effective for our purpose. We are still in the code development stage, and we expect that the pruning of categories will help increase reliability, but this raises the question of feasibility of our task.

We have learned a great deal about how to effectively interview (Rogers & Reisetter, 1989) and about how to write-up and code the interviews. The interview write-ups have been important for involving faculty in the ratings, but they are time-consuming to do rigorously. As a result, we have transcribed the interviews, and plan to begin coding from the interviews. And yet, we find ourselves again confronting a new challenge, coding reliably from the the interview transcription. Our goal of coding all of the 1590 alumnae events, seems to recede before us. We are constantly in the process of re-evaluating what can be accomplished and what sub-goals would be meaningful. As is often the case in research using qualitative data, the number of cases that can be processed is affected by the depth of the analysis and the amount of text to be consumed.

Contributions

These preliminary findings support our continuing efforts to develop a taxonomy of generic, holistic, and developable abilities commensurate with the ill-structured performance settings of college graduates. Although we are just beginning, our contribution is related to having confronted and taken on this difficult task. In doing so, we are identifying issues and method that will enable us to better ask and answer the right questions, even if we answer them with other questions. We have a demonstrated, with our initial analyses, that faculty judgments of effective performance are related to independent judgments of generic abilities in a sensible and consistent fashion. In other words, the data are consistent with our assumptions and expectations. As a result, we have developed more confidence in our ability to develop a taxonomy of generic abilities that can be coded across professional and personal activity areas.

A strategy for coding generic abilities that distinguish effective alumnae performance could be a significant methodological contribution to college outcomes studies. Consider the limitations of the alternatives. How does one anchor self-ratings? How does one equate salary across professions, and what about volunteer work and family activities?

We have argued that this college supported work has a potential for contributing to a broad taxonomy of post-college abilities, and that such a taxonomy may contribute to an understanding of adult abilities with implications for educational practice. Any potential for making such a contribution, that is external to the college, is dependent upon the capacity for this kind of work to also make a difference to college itself. In large measure, this means that the work needs to have a potential for improving teaching on learning in the institution. Of course, this is also true for all of the different components of the Alverno Longitudinal Study that are described above. The next section addresses some specific connections between evaluation activities and curriculum improvement. The section will cover a range of strategies. As such, it will include an example of how the BEI management study conducted by Alverno had an impact on curriculum development.

EXAMPLE V: PROFESSIONAL ABILITIES AND STUDENT OUTCOMES

Synopsis

William Rickards describes selected sub-strategies used in the evaluation of general education outcomes and the major field, with attention to the processes by which evaluation, research, teaching and curriculum development are integrated in the institution. Results are summarized from the studies of professional abilities in nursing, management and teaching and their role in each major field's evaluation. The current emphasis on describing patterns of change in student performance within the major field has helped establish procedures for organizing student performance data in relation to departmental outcomes and in developing linkages between data collection and analysis and curricular elements that can increase the quality of overall evaluation and its potential contributions to the institution and higher education assessment.

PROFESSIONAL ABILITIES AND STUDENT OUTCOMES

Introduction

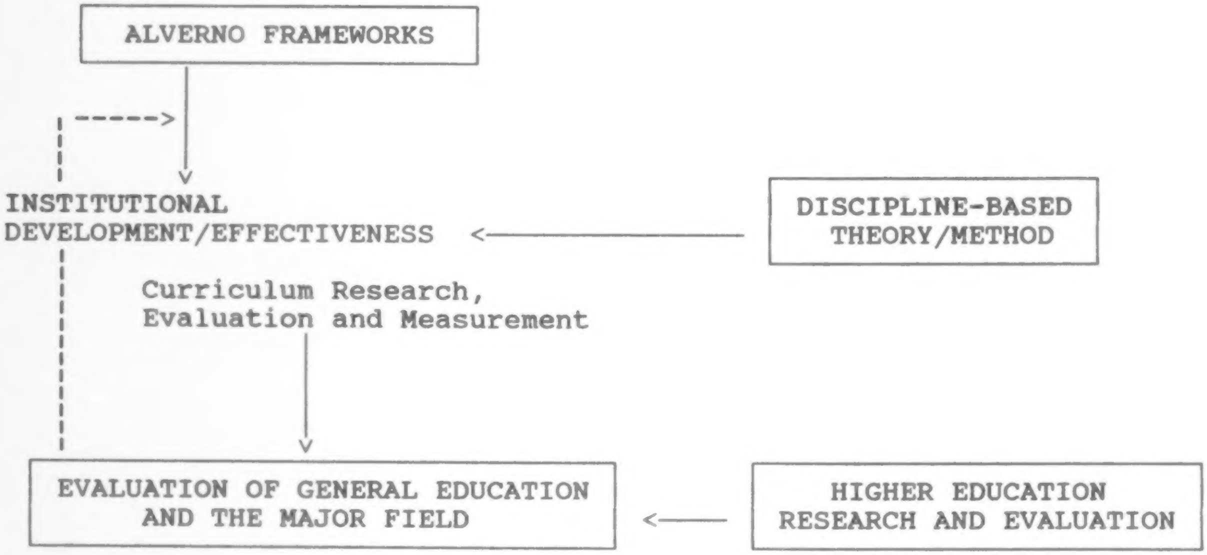
Evaluation has had a central role in the Alverno research program since its inception. According to the mission of both the college and the office, the process of "validating" Alverno educational frameworks creates the institutional need for an evaluative framework in which teaching, research, evaluation and curriculum development are integrated (refer to Figure 3).

This dimension of the Office's work -- evaluation in general and the evaluation of department majors in particular -- is shaped by the overall educational research program and faculty-designed assessment procedures throughout the college. Each of the research and evaluation strategies -- including those in the Alverno Longitudinal Study -- involve certain applications to curriculum and instruction. The involvement of ORE staff in college functions and committees, and in the creation of processes that ensure faculty and research staff collaboration, bridges instructional and research units. Rather than a passive transfer of information among instructional and research units, the Evaluation of the Major Fields is another active strategy which implements research and evaluation and concepts of adult development, learning and abilities in the study of student performance in discipline. (Figure V-1)

- Evaluation of the major field activities ensure the continuity of the research effort and its utility within the college by employing some of the same frameworks of data collection and analysis {e.g., the Behavioral Event Interview, self-evaluation, the Perry (1970) scheme}. This strategy also benefits from and contributes to the faculty's orientation to working with concepts of adult learning and development in relation to curriculum and instruction.

- Using the assessment-as-learning measures inherent in the curriculum and the Office's own analytic strategies, the evaluation of the major field is currently focusing on preparing aggregate and developmental portraits of student performance in the context of a discipline, examining inter- and intra-individual patterns of change. This frame of analysis differs from the departments' on-going evaluations and the self-studies which might be required in curriculum review or accreditation. Here we take another kind of "look." It is based on systematic data collection of aggregated student performances, supported by analyses from ORE, as a another perspectives from which to examine the curriculum.

Figure V-1. Evaluation of general education and major field outcomes.


ALVERNO FRAMEWORKS
INSTITUTIONAL DEVELOPMENT/EFFECTIVENESS
DISCIPLINE-BASED THEORY/METHOD
Curriculum Research, Evaluation and Measurement
EVALUATION OF GENERAL EDUCATION AND THE MAJOR FIELD
HIGHER EDUCATION RESEARCH AND EVALUATION

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- The approaches allow for testing and validation of curricular elements in terms of both (a) selected models of adult learning and development and (b) discipline-based frameworks.

- Because this is an internal evaluation process, integrated into the college's mission, it benefits from certain elements, but also must meet certain standards (cf., House, 1986, Sonnichsen, 1987). As an internal activity, it is possible for the evaluators to understand conditions with greater depth and to have an investment in the use of findings. At Alverno, evaluation is integrated into the academic aspects of the operation rather than the administrative. Furthermore, it involves faculty members and departments as active contributors and maintains their investment in the results and the process. This relationship requires that external frameworks be incorporated in the data collection, including those that involve undergraduate education, the theories and methods of adult development, learning and abilities, and the principles and practices of higher education research and evaluation. Thus, part of the challenge which defines this type of evaluation activity is the need to resolve quality and utility -- that is, objectivity, rigor, and professional standards with usefulness and feasibility.

The strategy for evaluation of general education and the major fields can be broken open into sub-strategies using data from several different sources:

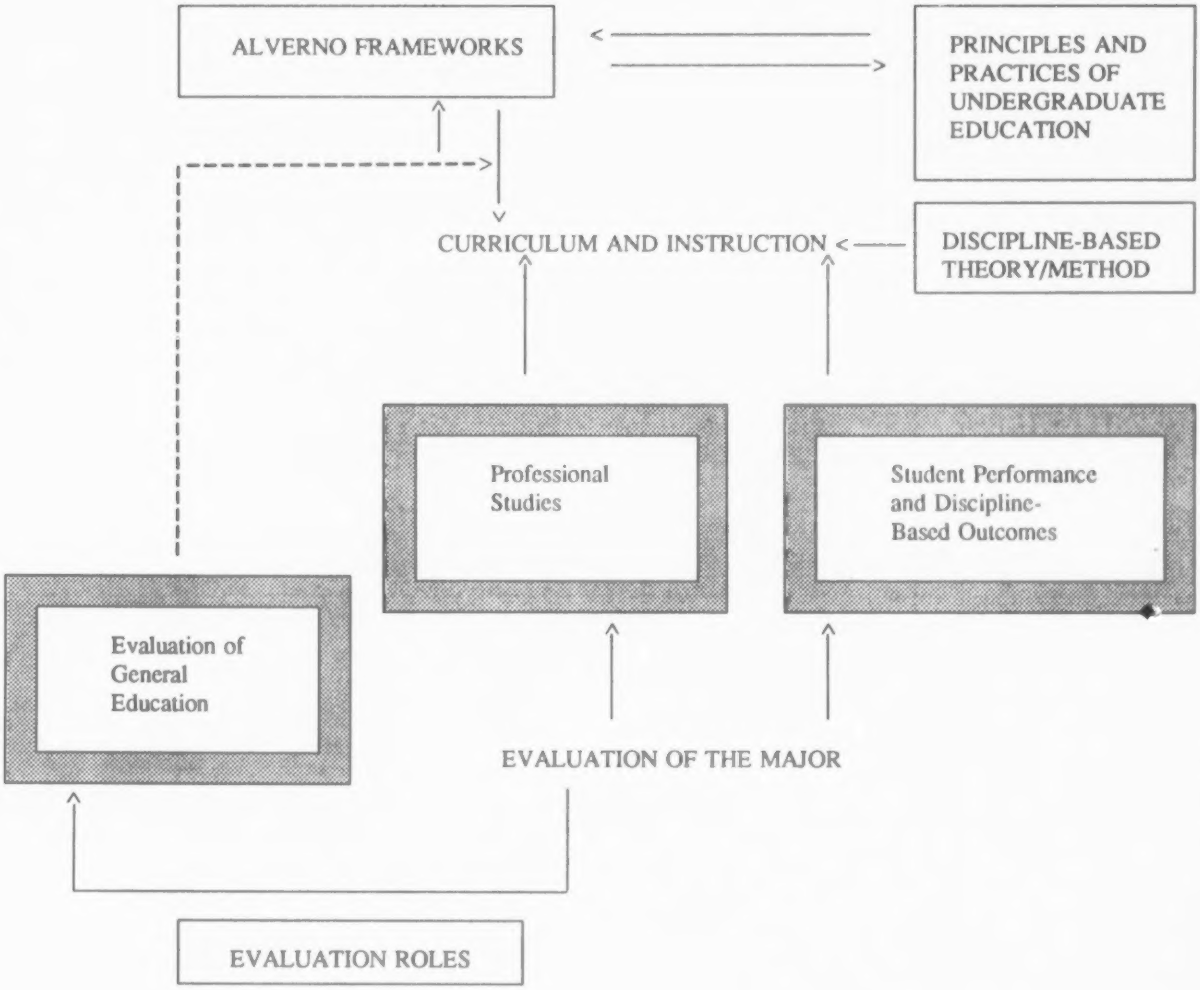
General Education-
- Alverno Mission
- Eight abilities
- Domains of knowledge

Major Fields-
- Description of the Major
    - Learned societies
    - Professions
    - Other college faculty
- Literature review
- Interdisciplinary dialogue
- Multicultural frameworks
- Competence chair review
- Credentialing groups
- Professional performance and alumnae studies

Three of these will be discussed here: general education outcomes; professional studies aimed at refining discipline based outcomes;and patterns of student performance in relation to discipline-based outcomes. (Figure V-2)

The remainder of this section provides a brief overview of these studies, some applications from the current work on student outcome patterns, and a review of the challenges and unresolved issues which emerge for the evaluation of the major field.

Figure V-2. **Evaluation Strategies**


ALVERNO FRAMEWORKS
PRINCIPLES AND PRACTICES OF UNDERGRADUATE EDUCATION
CURRICULUM AND INSTRUCTION
DISCIPLINE-BASED THEORY/METHOD
Professional Studies
Student Performance and Discipline-Based Outcomes
Evaluation of General Education
EVALUATION OF THE MAJOR
EVALUATION ROLES

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Internal and External Contributions: The Studies

The Evaluation of Outcomes in General Education. The Alverno Longitudinal Study has focused on evaluation of the general education curriculum and has included connections to discipline-based research frameworks. For example, in an earlier section, Reisetter has discussed ego, moral and cognitive development using measures from these research traditions and discussed the possibilities of making contributions to these discipline-based theories. But these contributions to discipline-based theory are only feasible within college outcome studies if they also make a contribution to curriculum development and teaching within the college. Although the evaluation of general education outcomes differs from the evaluation of individual major fields, this aspect of the research work is integral to more specific evaluations and sets a foundation from which subsequent evaluations build.

> In some cases, the methods used and even developed in the study continue to be used across campus. Human Potential Measures have been and will continue to be used in future analyses. For example, the Learning Styles Inventory (Kolb, 1984) is regularly administered (Mentkowski & Giencke-Hall, 1982). Developmental theory -- for example, Perry's (1970) scheme of intellectual and ethical development, Kohlberg's (1981b) Rest's (1979a, 1986) schemes of moral development -- continues to inform curriculum development and practice, even though the thinking of the faculty does not rely on any one theory. There is a dynamic interplay between the work of our office and the work of other departments. For example, in some cases, methods such as the Behavioral Event Interview were being developed simultaneously for use in the research efforts and in other departments. As a result of this dynamic interplay, the office is prepared to adapt the instruments and analytic techniques to current use in curriculum, and there is a readiness among faculty to use the language, concepts and findings which are produced.
>
> This approach also produced a baseline of data on achievement and the persistence of general education outcomes. For example, as Deemer describes earlier in this document, the Perspectives Interviews provide descriptions of longitudinal changes, the developing use of criteria, and the ability to self assess; the data from the Perspectives Interviews and other measures provide foundations for examining student progress within the major field as well as differences in individual and aggregate progress.
>
> Furthermore, the ability to define the extent of general education outcomes becomes critical in the evaluation of major fields so that relationships among general education outcomes, major field outcomes and instruction in major course work can be explicated.

Professional Studies. As we turn to more specific evaluations of individual major fields, we find that the research efforts of the Longitudinal Study continue to provide frameworks and relevant data. Using methodology derived from the Behavioral Event Interview, and cooperative research involving faculty and research staff, the Professional Studies examined relationships between professional abilities and curricular programs within the college. The studies resulted in models of professional abilities for use in other educational contexts while contributing internally to curriculum, instruction and assessment procedures.

Between 1979 and 1983, the studies were conducted with three divisions with professional preparation programs: Education, Nursing, and Business and Management. The general purpose for the second two studies was to study the on-the-job performance of outstanding professionals who were not our graduates. In education, data were generated from literature review, interdisciplinary team work, and a student performance review. From these data, three competence models of interrelated abilities were developed. Each division evaluated the central elements in the department's curriculum against a model. This activity focused primarily on the major outcomes which were identified in each department and around which the curriculum was organized. These models were also disseminated through the publications cited below.

o Teacher Education: A Developmental Model of Teacher Competence

The work involved four years of study with faculty members in the college, across disciplines, and reviews of student performance, as well as a review of the teacher education literature. It resulted in the articulation of five competences as developable abilities which were begun and fostered through course work and refined over the professional career (Diez, 1990). These abilities were prepared as "maps" (Figure V-3) which described the status of each as:

- the basic/beginning abilities of educators entering the field (e.g., student teaching, first year)
- developing abilities characteristic of teachers with several years experience
- advanced abilities which mark a master teacher who has demonstrated professional depth and development.

The "basic/beginning abilities" were designated as the broad target for teacher preparation and were eventually designated as the advanced outcomes for the the Teacher Education program. The basic/beginning information from the maps was incorporated with data from other sources in the development of various instruments for rating fieldwork performance for students. Specifically, basic/beginning abilities are the source for the criteria in the comprehensive assessment used to assess performance in the student teaching semester.

Figure V-3. Model of the development of teacher abilities (1984).

Ability 1: CONCEPTUALIZATION. Integrating content knowledge with educational framework and a broadly-based understanding of the liberal arts in order to plan and implement instruction.

BASIC/BEGINNING ABILITIES

Applying analytical skill to the integration of knowledge base and psychological/philosophical foundations of education
- Showing command of subject areas
- Presenting subject matter in conceptual context

Linking frameworks	Content knowledge base e.g., math, language arts Educator frameworks e.g., cognition, development psychology, curriculum theory Liberal art skills e.g., reflection, epistemology inquiry approaches

Developing sensitivity to learners as individuals within the group as a whole
- Making links between developmental theory and concrete individuals, e.g., using appropriate depth of subject matter, showing understanding of student behavior and motivation
- Planning material both to meet learners current needs and to lead to the next level of development, e.g., using logic in the development of subject matter, relating subject matter to previous work, helping students to relate subject matter to "real life" experiences
- Analyzing effect of class activities on both individuals and class as a whole

Developing an understanding of the system within which one works as educator
- Recognizing communication networks in the organization
- Learning the history and philosophy of the organization
- Becoming aware of developmental sequences in the system

DEVELOPING ABILITIES

Building increased ability to use the knowledge base as a resource in facilitating learning
Continuing to expand and develop own knowledge base in all these areas

Increasing sensitivity to learners in a group and as individuals
- Trying to meet learners' perceived needs
- Trying to stretch student to the next steps in their development
- Sensing multiple possibilities, i.e., the array of things that might happen, that one might do
- Predicting the impacts of various strategies
- Evaluating plans in relationship to outcomes in a systematic and ongoing way
- Constantly relating information to frameworks

Refining understanding of the system
- Knowing what others have done/are doing (e.g., in previous classes, in concurrent classes)
- Knowing the whole educational sequence and learners in relationship to it

Developing tolerance for ambiguity by making links between the ideal and the real
- Constantly responding to unpredictable source of input
- Recognizing that one cannot demand resolution

ADVANCED ABILITIES

Showing commitment to a style of thinking within one's discipline
- Taking responsibility for clear presentations providing for common experiences
- Finding ways to make links with students' ongoing experience, letting go of one's involvement with content in order to promote class dialogue

Show high ability to pick the right strategy for the right situation
- Calling forth higher level learning
- Facilitating high level discussion (e.g. beyond the "internalize my ideas and frameworks" sort)
- Figuring out the patterns in interaction to help the learner bring analytic thinking to a new level

Modeling an adult learning process
- Showing own growth and reflecting on own growth
- Shaping the relationships between the concrete skill processes focused on and "own lives" to show educational environment as transforming
- Acting with creative awareness of how to use the system to support and promote learning skills
- Operating with autonomy, able to singlehandedly manage multiple schemes, individuals and interactions

From: Diez. (1990). A thrust from within: Reconceptualizing teacher education. Peabody Journal of Education, 65(2), p. 11

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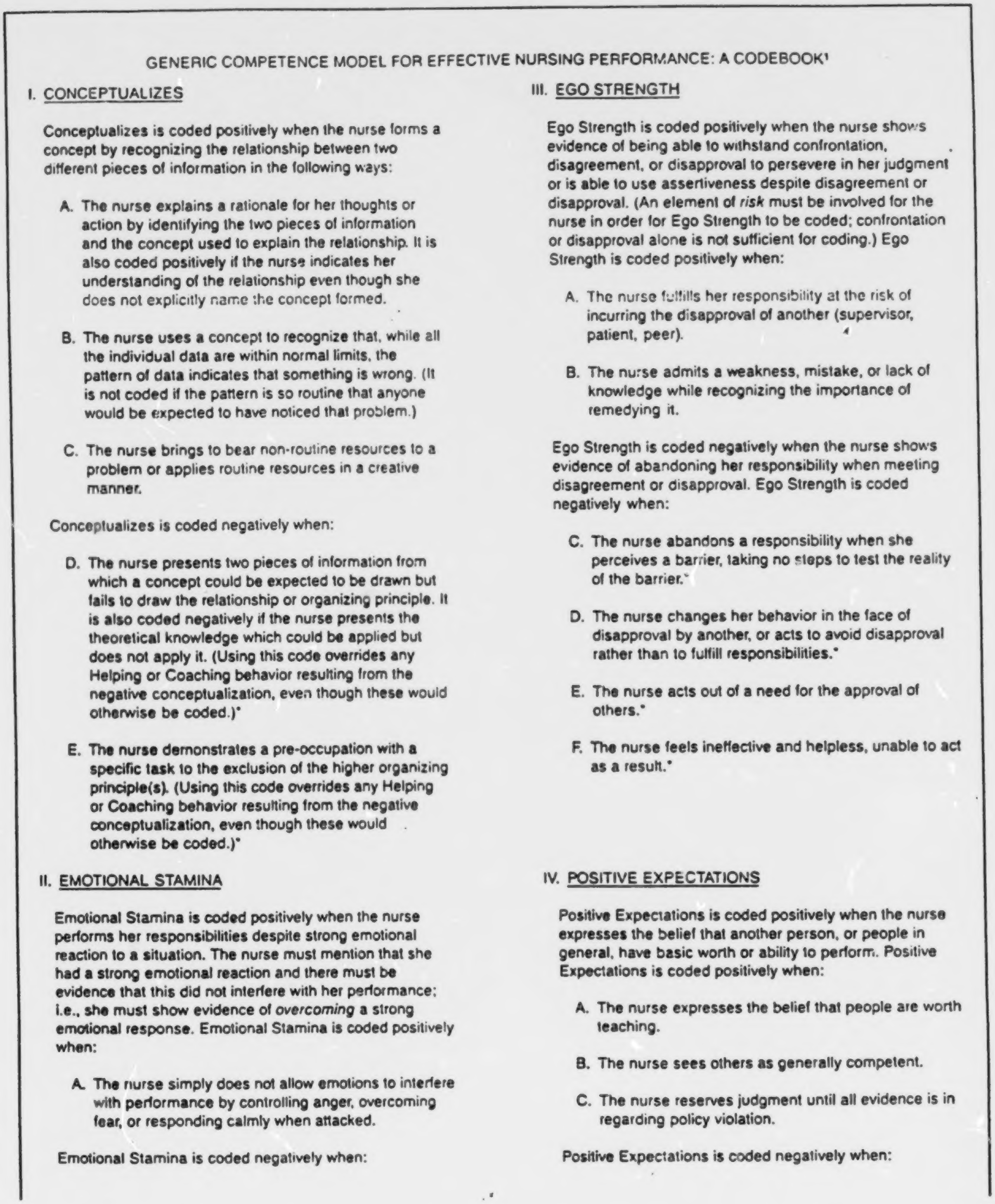
- Developing a professional Competence Model for Nursing Education

Using the procedure of Job Competence Assessment, Nursing faculty and Office of Office of Research and Evaluation staff conducted Behavioral Event Interviews with nurses in a three health care settings to establish the professional competence model. Results showed that competences apply significantly more often to nurses with education at the baccalaureate level or higher and to nurses with more experience (more than 5 years). Findings helped establish the validity of the core elements in the Nursing curriculum. (See Figure V-4, also DeBack & Mentkowski, 1986)

Figure V-4. **Nurse performance by education and experience.**



GENERIC COMPETENCE MODEL FOR EFFECTIVE NURSING PERFORMANCE: A CODEBOOK[1]

I. CONCEPTUALIZES

Conceptualizes is coded positively when the nurse forms a concept by recognizing the relationship between two different pieces of information in the following ways:

A. The nurse explains a rationale for her thoughts or action by identifying the two pieces of information and the concept used to explain the relationship. It is also coded positively if the nurse indicates her understanding of the relationship even though she does not explicitly name the concept formed.

B. The nurse uses a concept to recognize that, while all the individual data are within normal limits, the pattern of data indicates that something is wrong. (It is not coded if the pattern is so routine that anyone would be expected to have noticed that problem.)

C. The nurse brings to bear non-routine resources to a problem or applies routine resources in a creative manner.

Conceptualizes is coded negatively when:

D. The nurse presents two pieces of information from which a concept could be expected to be drawn but fails to draw the relationship or organizing principle. It is also coded negatively if the nurse presents the theoretical knowledge which could be applied but does not apply it. (Using this code overrides any Helping or Coaching behavior resulting from the negative conceptualization, even though these would otherwise be coded.)*

E. The nurse demonstrates a pre-occupation with a specific task to the exclusion of the higher organizing principle(s). (Using this code overrides any Helping or Coaching behavior resulting from the negative conceptualization, even though these would otherwise be coded.)*

II. EMOTIONAL STAMINA

Emotional Stamina is coded positively when the nurse performs her responsibilities despite strong emotional reaction to a situation. The nurse must mention that she had a strong emotional reaction and there must be evidence that this did not interfere with her performance; i.e., she must show evidence of *overcoming* a strong emotional response. Emotional Stamina is coded positively when:

A. The nurse simply does not allow emotions to interfere with performance by controlling anger, overcoming fear, or responding calmly when attacked.

Emotional Stamina is coded negatively when:

III. EGO STRENGTH

Ego Strength is coded positively when the nurse shows evidence of being able to withstand confrontation, disagreement, or disapproval to persevere in her judgment or is able to use assertiveness despite disagreement or disapproval. (An element of *risk* must be involved for the nurse in order for Ego Strength to be coded; confrontation or disapproval alone is not sufficient for coding.) Ego Strength is coded positively when:

A. The nurse fulfills her responsibility at the risk of incurring the disapproval of another (supervisor, patient, peer).

B. The nurse admits a weakness, mistake, or lack of knowledge while recognizing the importance of remedying it.

Ego Strength is coded negatively when the nurse shows evidence of abandoning her responsibility when meeting disagreement or disapproval. Ego Strength is coded negatively when:

C. The nurse abandons a responsibility when she perceives a barrier, taking no steps to test the reality of the barrier.*

D. The nurse changes her behavior in the face of disapproval by another, or acts to avoid disapproval rather than to fulfill responsibilities.*

E. The nurse acts out of a need for the approval of others.*

F. The nurse feels ineffective and helpless, unable to act as a result.*

IV. POSITIVE EXPECTATIONS

Positive Expectations is coded positively when the nurse expresses the belief that another person, or people in general, have basic worth or ability to perform. Positive Expectations is coded positively when:

A. The nurse expresses the belief that people are worth teaching.

B. The nurse sees others as generally competent.

C. The nurse reserves judgment until all evidence is in regarding policy violation.

Positive Expectations is coded negatively when:

278 VOL. 25, NO. 7, SEPTEMBER 1986

From: DeBack & Mentkowski (1986) Does the baccalaureate make a difference?: Differentiating nurse performance by education and experience, Journal of Nursing Education, 25, p. 278-80.

Figure V-4 (continued). Nurse performance by education and experience.

B. The nurse presents evidence that an emotional response interfered with her performance.*

C. The nurse gives evidence that bottling up a strong emotional response interfered with her performance.*

V. INDEPENDENCE

Independence is coded positively when the nurse takes an action when there is no external pressure to do so. Independence is coded positively when:

A. The nurse takes an advocacy role for a patient or subordinate.

B. The nurse takes responsibility for her own judgment and acts independently.

Independence is coded negatively when:

C. The nurse avoids taking responsibility for her own judgment and/or gives up.*

VI. REFLECTIVE THINKING

Reflective Thinking is coded when the nurse identifies and reflects upon her own behavior, feelings, or beliefs and their consequences. It may include reflecting upon a weakness or mistake, and must result in the nurse showing new insight or searching for new insight.

VII. HELPING

Helping is coded when the nurse takes action to help a patient or subordinate personally or demonstrates a concern for the other person's needs. (There must be evidence that *both* the nurse and the person she is helping are seeking the same goal.)

D. The nurse looks down on a person as being incapable.*

E. The nurse treats a person as a member of a class rather than as an individual (stereotypes) or generalizes from individual to group behavior.*

VIII. INFLUENCING

Influencing is coded when the nurse shows a concern for changing the attitude or behavior of others for a purpose. (There must be evidence that these others are *not* seeking the same goal the nurse is seeking for them.)

Influencing is coded when:

A. The nurse attempts to persuade someone to follow her example.

B. The nurse provides a rationale for the desired behavior, including appealing to a higher motive.

C. The nurse persuades by a variety of strategies or searches for one strategy from alternatives.

D. The nurse uses a strategy to refocus from negative emotions to more constructive issues.

E. The nurse provides valid information in order to change attitude or behavior.

IX. COACHING

Coaching is coded when the nurse uses any of a variety of strategies to instruct, train, or encourage patients or subordinates to accept more responsibility for themselves or for their jobs. Coaching can also be seen as a specialized form of INFLUENCING in that the strategies used are ways to influence combined with the motive to increase the other's responsibility.

Coaching is coded when:

A. The nurse gradually increases the responsibility for tasks or for self-care.

B. The nurse rewards desirable behavior or gives positive feedback in other ways.

C. The nurse provides information to increase the other's responsibility.

D The nurse fits a task to a perceived interest in a subordinate or patient.

(continued)

Figure V-4 (continued). **Nurse performance by education and experience.**

Helping is coded when:

A. The nurse listens actively and attentively. (There *need not* be evidence that the person she is listening to recognizes this behavior on the part of the nurse.)

B. The nurse searches for methods of establishing rapport.

C. The nurse provides valid information.

D. The nurse acknowledges the needs of another. (This requires evidence from the person whose needs are being acknowledged that she/he recognizes the acknowledgment.)

E. The nurse searches to understand the other's perspective.

F. The nurse acknowledges the needs of another. (This does not require evidence from the person whose needs are being acknowledged that she/he recognizes the acknowledgment.)

[1]Table 5 is drawn from a research report by Mentkowski, DeBack, Bishop, Allen, and Blanton, (1980) "Developing a Professional Competence Model for Nursing Education," which was funded by a grant from the National Institute of Education. The report is available from Alverno Publications, 3401 South 39th Street, Milwaukee, Wisconsin 53215, or ERIC Document Reproduction Service (No. ED 239 565).

Note: An asterisk after a behavioral descriptor in competencies I, II, III, IV, and V is a reminder that a behavioral descriptor stated for positive categories is not used for negative coding.

EDUCATION AND EXPERIENCE
MAIN EFFECT MEANS AND STATISTICAL SIGNIFICANCE
MEANS AND PROBABILITY VALUES

Education Competence	Less Education M	More M	Experience (p value)	Less Experience M	More M	(p value)
Conceptualizing +	.42	.69	(<.07)	.28	.71	(<.02)
Conceptualizing −	.53	.24	(<.03)	.45	.33	n.s.
Emotional Stamina +	.16	.24	n.s.	.34	.12	(<.07)
Emotional Stamina −	.00	.07	(<.09)	.03	.04	n.s.
Ego Strength +	.13	.52	(<.004)	.24	.38	(<.09)
Ego Strength −	.13	.05	(<.09)	.14	.06	n.s.
Positive Expectations +	.03	.10	n.s.	.03	.08	n.s.
Positive Expectations −	.11	.07	n.s.	.17	.04	(<.06)
Independence +	1.13	2.05	(<.005)	1.62	1.58	n.s.
Independence −	.18	.31	n.s.	.34	.19	n.s.
Reflective Thinking	.11	.24	(<.06)	.10	.21	(<.09)
Helping	3.11	2.40	(<.05)	3.24	2.42	(<.04)
Influencing	1.84	2.33	(<.04)	1.21	2.56	(<.001)
Coaching	.89	2.00	(<.005)	1.34	1.60	n.s.

A plus or minus after a competence indicates whether the behavioral descriptors were positive or negative.

NOTE. A higher mean value indicates more frequent codings of incident for this competence category. The analysis of variance procedure assigned 1 and 76 degrees of freedom to each effect; n.s. = greater than one in ten chance that any difference between means is due to chance.

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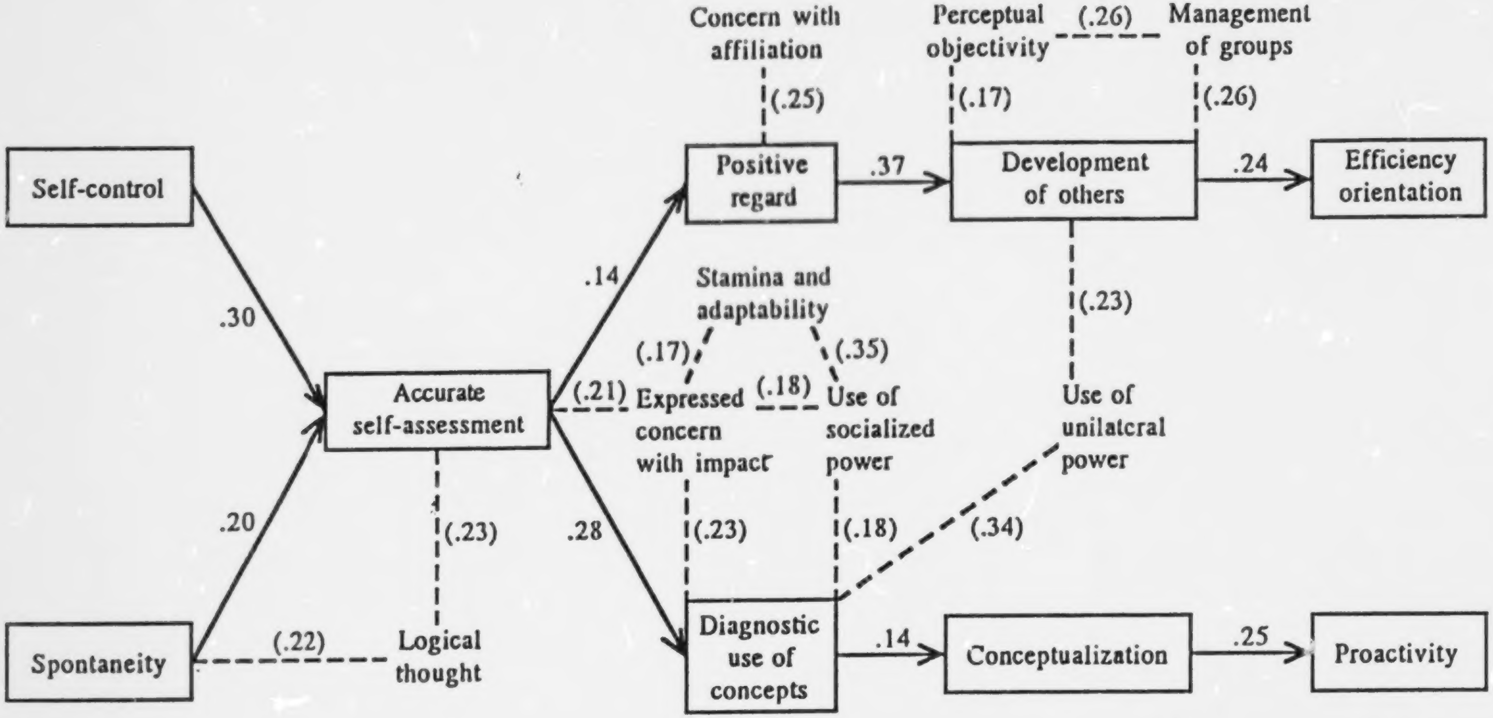
- Developing a Professional Competence Model for Business Education

As with the Nursing Division, business and management faculty and Office of Research and Evaluation researchers used the Job Competence Assessment methodology to ascertain the abilities which distinguished outstanding women managers and executives (Mentkowski, O'Brien, McEachern & Fowler, 1982; also discussed in Mentkowski, 1988a). The study had three major outcomes:

- A competence model of effective managerial performances that can serve to improve management education programs (Figure V-5)
- A pool of over 500 behavioral examples set within particular contexts that can serve as instructional tools, assessment criteria and feedback for management students
- Better advice for women students seeking examples of careering and professional development and how it relates to effective performance in the managerial role.

After reviewing the competence, the business and management faculty incorporated several findings. For example, expanded the outcomes all students are expected to demonstrate to include one which dealt with taking initiative in identifying and solving problems or taking a leadership role in helping the organization take advantage of growth opportunities. They also developed a number of instructional and assessment techniques to address critical incidents from on-the-job performance.

Figure V-5. Hypothetical model of competence in women managers and executives.


Concern with affiliation
(.25)
Perceptual objectivity
(.26)
Management of groups
(.17)
(.26)
Self-control
Positive regard
.37
Development of others
.24
Efficiency orientation
.30
.14
Stamina and adaptability
(.23)
(.17)
(.35)
Accurate self-assessment
(.21)
Expressed concern with impact
(.18)
Use of socialized power
Use of unilateral power
.20
(.23)
.28
(.23)
(.18)
(.34)
Spontaneity
(.22)
Logical thought
Diagnostic use of concepts
.14
Conceptualization
.25
Proactivity

Note: Numbers not in parentheses are path coefficients indicating the strength of the relationship between competences (derived from a factor analysis showing independence) included in a final path analysis (solid lines). Other competences that show a significant positive relationship to competences included in the path analysis are linked to them by broken lines. The bivariate correlation coefficients are placed in parentheses. Three competences, "specialized knowledge," "self-presentation," and "oral communication," did not meet the criteria for inclusion.

Source: Mentkowski, O'Brien, McEachern, and Fowler, 1982, p. 114.

From: Mentkowski (1988). Paths to integrity: Educating for personal growth and professional performance. In Srivastva and Assoc., Executive integrity. San Francisco: Jossey-Bass.

Student Performance and Major Field Outcomes. In the Professional Studies, professional performance expectations provided a lens through which to examine and contribute to major field outcomes. In the current evaluation emphasis, different ways of describing student performance are being developed as an additional perspective and a means for contributing to the development of curriculum and instruction.

Several institutionalized processes are already in place to provide departments with evaluative information (assessment-as-learning for individualized development, credentialing and program evaluation; department review, self-study for accreditation, etc.). In the current approach, systematic questions are being raised based on the patterns of student performances. This involves a stepping back from the immediate operation of instruction and day-to-day student performance assessment to examine the aggregate, longitudinal patterns of student performance:

1. To what extent can student performances on faculty-designed assessments in the major be aggregated and used to portray student progress through the curriculum? The accumulation and organization of these data provide a basis for examining particular student performances in relation to the major outcomes as well as a basis for charting intra- and inter-individual patterns of change.

2. Will an integrated picture of student performances yield the advanced outcomes in the discipline? What implications can be found in this type of analysis of student performance for the major field unit (i.e., curriculum, department, division)?

3. What broad differences can be described among students in the patterns which characterized their progress through the major? What implications do these patterns have for curriculum and instruction as the departments attempt to meet individual needs learning in the discipline?

While these questions are of particular consequence to the individual institution, they may also have more general importance:

> To what extent can such findings contribute to higher standards of post secondary instruction?
>
> And what methods can be developed to increase the usefulness of institutional assessment?

This dimension of evaluation provides a common ground where curriculum and instruction, institutional frameworks, and student development and learning are integrated and therefore a place where the perspectives of faculty members, researchers and administrators meet. It is a context in which significant questions can be raised and addressed.

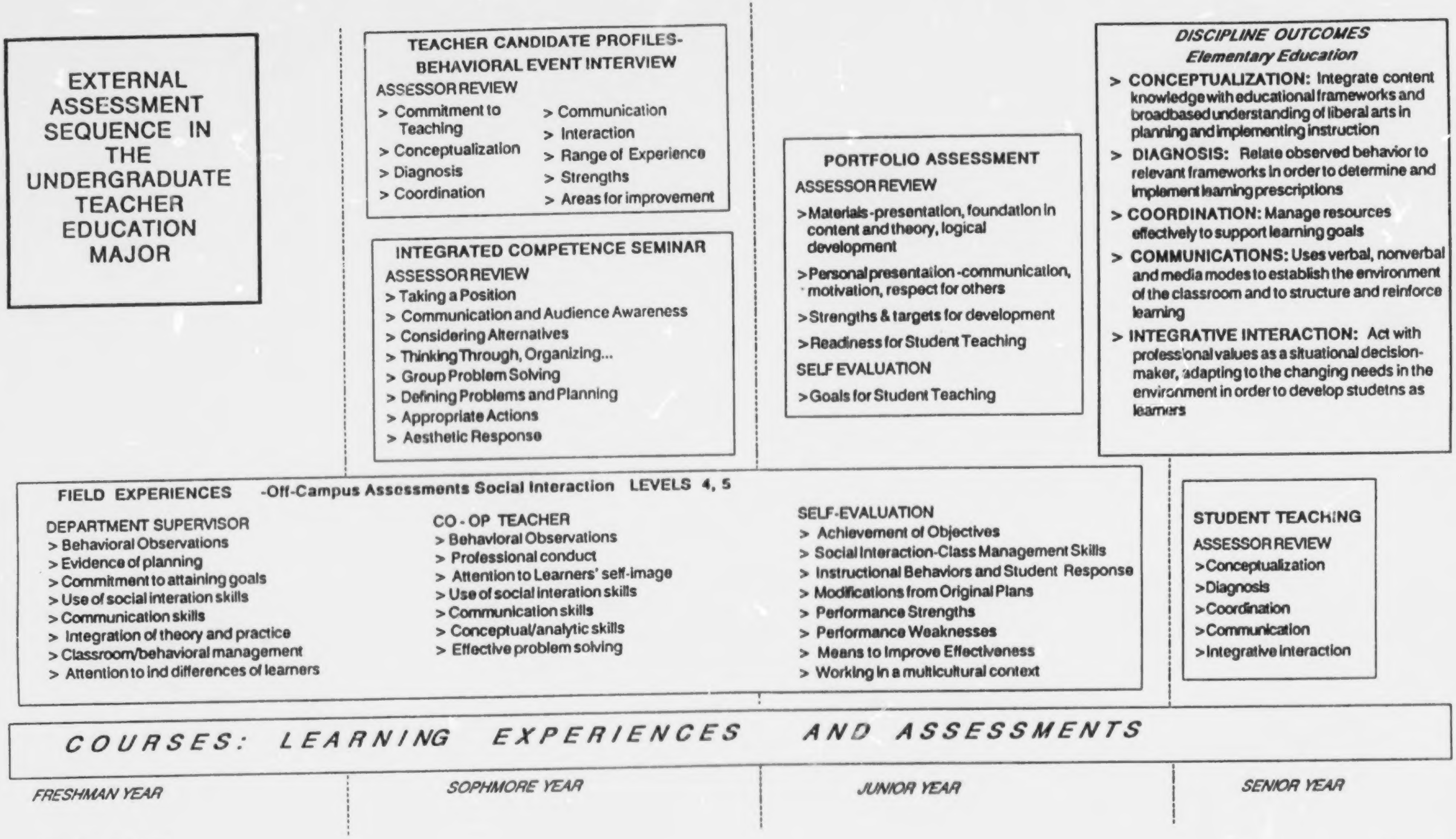
The work we report on here began in Fall 1990 with the Natural Sciences and the Education Divisions. The first step was to construct the portraits of student performance which would ultimately provide the basis for collecting data and structuring an analyses. This required considerable collaboration between and among department faculty and Office of Research and Evaluation staff in order to make the constructions adequate and usable. These, then, provided maps from which student performance data were identified. (See Figure V-6 for an example.)

Working with the faculty, different questions were posed by the different majors.

- Education Division

In Education, the concern was with students who were having uncommon difficulty in meeting performance expectations, particularly as they entered student teaching. Using samples of students who were clearly excelling and those who were experiencing uncommon difficulties, trajectories of student performance were prepared to examine different patterns. The actual measures included narrative assessments on performance (including a Behavioral Event Interview), quantitative ratings from fieldwork placements and the portfolio assessment procedures which are used in making decisions about student teaching. The data emphasized the role which personal maturation can play in performance and serves as a basis for continuing discussions on how curricular and instructional elements can respond to individual differences in maturity and inconsistencies in performance.

In itself, the portfolio assessment presented a unique opportunity for students themselves to define and present their individual trajectories in the major. The students' portfolios were assessed by practitioners in a half-day event which included group and individual interactions for students and assessors, lengthy discussions and consultations. The results demonstrated the ability of such an activity to put students' work in a longitudinal perspective, to clarify differences among individual students, and the values inherent in and implications of their diversity. In addition, the need to prepare the assessors for the kinds of roles which they would play as well as to further refine these roles was emphasized.



EXTERNAL ASSESSMENT SEQUENCE IN THE UNDERGRADUATE TEACHER EDUCATION MAJOR

TEACHER CANDIDATE PROFILES-BEHAVIORAL EVENT INTERVIEW

ASSESSOR REVIEW
- > Commitment to Teaching
- > Conceptualization
- > Diagnosis
- > Coordination
- > Communication
- > Interaction
- > Range of Experience
- > Strengths
- > Areas for improvement

INTEGRATED COMPETENCE SEMINAR

ASSESSOR REVIEW
- > Taking a Position
- > Communication and Audience Awareness
- > Considering Alternatives
- > Thinking Through, Organizing...
- > Group Problem Solving
- > Defining Problems and Planning
- > Appropriate Actions
- > Aesthetic Response

PORTFOLIO ASSESSMENT

ASSESSOR REVIEW
- >Materials-presentation, foundation in content and theory, logical development
- >Personal presentation-communication, motivation, respect for others
- >Strengths & targets for development
- >Readiness for Student Teaching

SELF EVALUATION
- >Goals for Student Teaching

DISCIPLINE OUTCOMES
Elementary Education

- > **CONCEPTUALIZATION:** Integrate content knowledge with educational frameworks and broadbased understanding of liberal arts in planning and implementing instruction
- > **DIAGNOSIS:** Relate observed behavior to relevant frameworks in order to determine and implement learning prescriptions
- > **COORDINATION:** Manage resources effectively to support learning goals
- > **COMMUNICATIONS:** Uses verbal, nonverbal and media modes to establish the environment of the classroom and to structure and reinforce learning
- > **INTEGRATIVE INTERACTION:** Act with professional values as a situational decision-maker, adapting to the changing needs in the environment in order to develop studetns as learners

FIELD EXPERIENCES -Off-Campus Assessments Social Interaction LEVELS 4, 5

DEPARTMENT SUPERVISOR
- > Behavioral Observations
- > Evidence of planning
- > Commitment to attaining goals
- > Use of social interation skills
- > Communication skills
- > Integration of theory and practice
- > Classroom/behavioral management
- > Attention to ind differences of learners

CO - OP TEACHER
- > Behavioral Observations
- > Professional conduct
- > Attention to Learners' self-image
- > Use of social interation skills
- > Communication skills
- > Conceptual/analytic skills
- > Effective problem solving

SELF-EVALUATION
- > Achievement of Objectives
- > Social Interaction-Class Management Skills
- > Instructional Behaviors and Student Response
- > Modifications from Original Plans
- > Performance Strengths
- > Performance Weaknesses
- > Means to Improve Effectiveness
- > Working in a multicultural context

STUDENT TEACHING

ASSESSOR REVIEW
- >Conceptualization
- >Diagnosis
- >Coordination
- >Communication
- >Integrative Interaction

COURSES: LEARNING EXPERIENCES AND ASSESSMENTS

FRESHMAN YEAR | *SOPHMORE YEAR* | *JUNIOR YEAR* | *SENIOR YEAR*

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Figure V-6.

o Natural Sciences Division

For Natural Sciences, the study focused on a senior self-evaluation in which students were asked to reflect on the full experiences of undergraduate work and the role which Alverno's curriculum played in their growth. In a pilot effort, the self evaluation essays for three students were rated using a coding system originally developed in regard to William Perry's (1970) scheme of intellectual and ethical development of college students and employed in the Longitudinal Study (Mentkowski, Moeser & Strait, 1983). The results provided an interesting opportunity for examining the interaction of general and discipline-based outcomes, relations between assessments and targeted outcomes, and increasing the use of evaluation measures within the curriculum.

Language and concepts appear in the text of some students' essays which suggest that the student values a set ideas even if she has not yet internalized them. This leads to questions about relationships between college and departmental outcomes, as well as how or when these need to be clarified in evaluation. The persistence of the fundamental, general education outcomes is of critical concern. But the impact of the discipline-based curriculum may appear superficial if students are focusing on the most fundamental themes which unite their undergraduate years in such essays.

In this small sample of essays, students ranged considerably in their approaches. For example, one student offered a fairly surface-level description of the general curriculum impact:

> My ability to analyze and to problem solve have also developed to a high level of skill...
>
> At Alverno I have achieved the ability to demonstrate all these different skills that I have just mentioned...
>
> I will strive to be an effective part of my community, to use my knowledge to help others and to better the world around me.

While another student demonstrated her more in-depth assimilation of the disciplinary content and her integration of social roles and academic expertise:

> As a junior, I was focused on finding who I was and what I wanted to do with my life. This not only involved contemplations about my major and career, but I also became concerned about my position in society as a Black woman...{An internship} not only broadened my perspective on the environmental concerns of businesses, but also gave me a chance to achieve one more thing I'd once doubted I could do...and that was be a professional.

> I'm concerned with what I learned in my biology and business courses more than ever...{but} I remind myself that being able to recite my education class by class is not as valuable as understanding the relationships connected to each class or being able to apply my knowledge in a useful situation.

The first student describes an appreciation of her multiple abilities, the other describes herself impelled toward personal and professional commitments.

To some extent, helping students make more thoughtful reflections can be addressed in the protocols for the self assessments/self evaluations used by faculty in the major to elicit student integration of their abilities, before entering the major and/or afterward. This kind of instrument development draws on the procedures used college-wide to develop and validate assessment instruments. However, the recognized potential for using these student performances as part of program evaluation may sharpen attention to certain aspects of the assessment protocol (e.g., how to elicit meaningful feedback and reflection on learning experiences).

As discussed in the introduction to this section, when faculty members read through the essays and the analyses, they clearly recognized common frameworks among the college's principles/practices and the analyses. This sets, in part, a unique context for moving between the results and the curriculum in an evaluation mode.

In themselves, these studies are not yet complete evaluations. At this stage, they are efforts which (a) establish procedures for organizing and analyzing student performance data in relation to departmental outcomes; (b) demonstrate the feasibility of these types of studies (including joint faculty-researcher efforts at dealing with student performance in her major field), and (c) develop linkages between data collection and analysis strategies and curriculum elements that can increase the quality of overall evaluation activity and the potential for impact. For a faculty already doing on the spot, on-going, and year end evaluations of student achievements and for an internal evaluation office, these are critical next steps.

SUMMARY AND CONCLUSIONS - UNRESOLVED ISSUES

In this section, the perspective has been taken that higher education assessment, if it is to have a significant impact, must integrate concepts of adult learning and development with issues of curriculum and instruction. Evaluations of major fields become a particularly fruitful means for bringing together different perspectives, giving faculty members and researchers an equal investment in student learning and development. This can result in risky, difficult confrontations, but working with the hard questions can lead us into more productive territory.

What may be unresolved issues from a research point of view may appear to be resolved for faculty members in the course of normal operations, or, at least, to pose different kinds of questions. For example, if a student is not meeting performance expectations because of her lack of personal maturity, faculty must still create learning experiences which will help the student as well as challenge their own ability to stimulate her development. But, more to the point, the types of concerns or paradoxes which characterize research may need to be dealt with differently from an evaluation perspective specifically because the work of curriculum proceeds regardless of these resolutions. Instruction may be hampered by the lack of resolutions or their inadequacy, but it proceeds nonetheless. Therefore, in the following paragraphs, three concerns are identified which may be resolved in practice at particular institutions but which remain continuing issues in the larger discussion around "good" institutional assessment in higher education.

The Internal Evaluator

Understanding distinctions between internal and external evaluations is useful, but the key role of internal evaluation in institutional assessment activities makes it more important to illuminate the benefits and challenges which emerge from an internal operation in a particular institution. A better understanding of how the tension discussed earlier between quality and utility can be resolved should contribute to the standards under which the most productive work will occur. At least one element in this is a collateral relationship between research/evaluation and curriculum/instruction, with a mutual investment in improving student learning and development. Earlier in this document, Rogers and Talbott have discussed how successful faculty involvement increases the potential for usefulness just as faculty leadership to the value of the professional abilities models. However, the fuller the integration of evaluation into the institution the more important it may become to evaluate the contribution of evaluation to the institution. The extent to which external frames of reference or criteria are used from educational specialities (such as educational research or evaluation) in various analyses is a partial answer, but the issue remains.

Separating -- and Dealing with -- the Outcomes of the College, the Discipline and Personal Maturity

Faculty seek to increase the learning of students despite a range of individual differences in maturity, and the college, the discipline and personal maturity that occurs during college all have distinct but combined impact on student outcomes. By defining these separate but combined effects and their interactions, an evaluation seeks to bring the most useful information into curriculum development. This seems implicit in higher education evaluation, but that doesn't mean that it can be easily achieved to serve the needs of faculty who are concerned about educating their students in the major field. In addition, as noted in this section in the discussion of the student self evaluations, some of the outcomes of undergraduate education may be so fundamental that they should have priority within more discipline specific outcomes. To some extent, this may also be a methodological concern, but it is one which will benefit from more attention.

The Evaluation Role in the Context of an Assessment Movement

Given its current place in history, a number of questions can be raised about how the current attention to higher education assessment differs from or relates to evaluation in higher education. An oversimplification of the concepts (e.g., evaluation deals with decision-making, assessment with measurement) may not be that helpful. We have presented a range of examples from research and evaluation activities here in order to ask the question in more depth, and to pinpoint the corresponding contributions of general research and evaluation practice to work in institutional assessment. At a time when higher education assessment is still developing conceptual frameworks, a great deal will be gained from a committed reflection on a range of approaches and methods.

SYMPOSIUM QUESTION FOUR: HOW CAN COLLEGE OUTCOMES STUDIES SIMULTANEOUSLY CONTRIBUTE TO AN INSTITUTION'S PURPOSES AND TO THE MORE GENERAL PURPOSES OF EDUCATIONAL RESEARCH AND POSTSECONDARY PRACTICE?

Alverno Question Four is the same: How Can Alverno College Outcomes Studies Simultaneously Contribute To An Institution's Purposes and to the More General Purposes of Educational Research and Postsecondary Practice?

Synopsis

Marcia Mentkowski provides a capstone description of lessons learned and unresolved issues that address simultaneous contribution to an institution's purposes and to the more general purposes of educational research and postsecondary practice.

Multiplicity of measures and theoretical frameworks are essential for a complex picture of college outcomes because of the limits of any single strategy or measure. Longitudinal results are useful for faculty understanding of student patterns long-term; performance-based measures used in evaluation of general education and the major field yield more usable data for program changes. Questionnaires are useful in demonstrating the degree to which alumnae perceive that personal and professional goals are met, but fail to address the complex performance outcomes achieved through studies of alumna and other professional abilities.

With a range of approaches and strategies and a corresponding set of diverse findings, faculty are better able to interpret growth patterns across domains in relation to curriculum. They are better able to understand how learning is constructed by students, which abilities are performed by alumnae, and how ability models of outstanding professionals can link to evaluation of student outcomes in the major field. External audiences are also likely to find contributions to a general picture of human potential useful as a backdrop to their own curricular development efforts, if they share a mission for teaching and student development.

There is a dynamic interplay between interactive, interdisciplinary, integrated research and evaluation approaches. Applying the combination of strategies needed by faculty to improve curriculum is essential. This, together with the intent to meet simultaneous internal and external contributions, can create paradoxes among conflicting criteria. Insights from dealing with paradox can illuminate institutional assessment as an emerging field, and identify criteria for quality assessment.

Contributions to Educational Research Methods and Discipline-Based Theory and Methods: Lessons Learned and Unresolved Issues

The five examples of contributions to a general picture of development, abilities and learning illustrate the dynamic interplay of research and evaluation approaches. There are a range of lessons learned and unresolved issues: only one of each is listed here for each example. Those related to symposium question four regarding simultaneous contribution are also discussed. (Refer to Symposium Questions 2 and 3 in Figure 1a, "Lessons Learned" and "Unresolved Issues".)

Example I: Cognitive, Moral and Ego Development Trajectories

Lesson Learned: Developmental trajectories differ across domains and timeframes.

Unresolved Issue: Who changes and why? What are best methods for analyzing intra- and inter-individual change patterns?

College outcomes include complex, holistic human abilities that develop differentially during college and afterward. Curriculum has more of an impact on the development of some of these abilities than others during college. But clearly, both older and younger students are achieving benefits, irrespective of the degree to which we can tie these benefits to the curriculum. More interesting are the patterns in these abilities in relation to each other. Now that we are analyzing a fourth data point -- after college -- our appetite is whetted for more information. The different trajectories of cognitive, moral and ego development presented in this symposium are a case in point.

Equally important is the time frame for development. There are differences in when these abilities develop during the college years, and now we have a partial window on how they develop afterward. The recognition measure of critical thinking reported on in this symposium can satisfy some who question whether students in an ability-based curriculum show upward growth on a traditional measure. That such change seems unrelated to curriculum is puzzling when some other production measures of critical thinking show such changes.

Moral judgment develops during but not after college; ego development occurs after college but not during. Why this happens this way for this group of individuals is not clear, but other researchers provide some clues. Rest would argue that once an individual leaves a formal educational setting, reasoning about moral issues would tend to plateau. We confirmed this. Loevinger suggests we would not see changes after college. We did not confirm this prediction. In sum, developmental trajectories show that cognitive development increases during and after college; moral judgment increases during college and plateaus afterwards; and ego development shows no change during college, but growth afterwards.

It is clear that definition and measurement of college outcomes needs to include a range of dimensions: cognitive/intellectual process, affective/socio-emotional process, perceptions, motivation, and performance. Most educators are struck by the difficulty of any attempt to separate these aspects. Yet attention to each dimension in turn may be necessary to enable students to integrate them later on. The form integration takes across the ten-year period under study is of interest to us, and one of our next analysis questions.

Unresolved is the question of how to best illuminate patterns of change in each of these dimensions. Once we untangle inter- and intra-individual differences, will it make sense to look at these dimensions once again in the aggregate?

EXAMPLE II: Self-Sustained Learning and Development

Lesson Learned: Knowledge and performance are linked in student constructions and attributed to curricular elements; understanding criteria leads to self-sustained learning.

Unresolved Issue: What student perspectives and curricular elements relate to gains in cognitive, moral and ego development?

It seems likely that our best understanding of integration of abilities, learning and development may be derived only from the student's own perspective. To our surprise, our studies of student perspectives -- known too often in the literature as "only self-report" -- had the greatest benefit for our faculty colleagues. Insight into how the student thinks about learning, abilities, and her own development -- and particularly to what elements of the curriculum she attributes her learning, were helpful to faculty on a variety of fronts, and also helped create a learning inventory that is currently helpful to students and faculty alike.

So far, descriptions of learning outcomes from the perspectives interviews mirror to some extent similar descriptions by David Kolb and William Perry; the linking between knowledge and performance in student perspectives is a new finding. A perspectives interview data base is useful in providing a picture of these outcomes in relation to the curricular elements that, in the students' mind, contribute to independent learning, making relationships between abilities and their use, and using different ways of learning. Development in students' understanding of criteria -- the behavioral descriptors that faculty and students use to evaluate performance -- lead to self-sustained learning.

Coming up with feasible and rigorous methods is a continuing challenge, and we look forward to completing our analyses of student and alumna perspectives on learning and developmental domains, using better qualitative analytic technologies.

In the future, we expect to analyze the quantitative trajectories of cognitive, moral and ego development in relation to the more indepth picture of individual development that the interviews provide. Here is where our most likely contribution to developmental theory will occur. Here we will be able to pinpoint elements in the curriculum linked to cognitive-developmental patterns, and search for learning strategies linked to development during college and afterward.

Example III: Career Trajectories of Women

Lesson Learned: Older and younger women achieve management and professional positions after college.

Unresolved Issue: What alumnae measures consider the intersection of personal and professional, public and private contributions?

Our graduates have much to teach us about how women fare after college. The questionnaire data is positive; Alverno women are satisfied with their majors. They report that education prepared them well for life after college, particularly for life-long learning, and they give the college even higher marks for liberal arts outcomes than for career-related benefits.

Older and younger women achieve management and professional positions after college. Thus, our results can contribute to the picture of women's experience in a managerial roles that, compared to nursing and teaching, are non-traditional for women. What are the abilities younger women use to manage career/family conflicts, especially if they have young children (Mentkowski, 1983)? Do some of the older women experience a glass ceiling or age discrimination as they try to move out of clerical positions after college? To what degree are older women stymied by secure financial benefits that a "job-in-the-hand" provides?

The study of career trajectories has been hampered by a lack of indicators that describe mobility for women adequately. Clearly, analysis of the interplay between personal and professional, private and public responsibilities is a center stage issue for liberal arts colleges preparing women for professional careers.

Example IV: Alumnae Generic Abilities

Lesson Learned: Some generic abilities distinguish effective alumnae performance.

Unresolved Issue: How well do generic ability codes cross a wide range of personal and professional activities?

Descriptions of alumnae generic abilities are more interesting to us at the moment than questionnaire data. But the difficulty of creating generic codes that cross personal and professional contexts is daunting at times.

A picture of performance from the alumnae ability studies tells a more complex story, one that rests on events alumnae relate about times they were successful, and times when they did not meet their objectives. Faculty ratings of these events pinpoint those where alumnae performance did not meet faculty expectations, as well as situations where they did. Clearly, pictures of performance have the potential to revise faculty expectations, and also to set standards for performance. As more studies like this one are conducted, higher education may be in a better position to describe how alumnae actually perform, and refine or revise claims for college outcomes accordingly.

EXAMPLE V: Professional Abilities and Student Outcomes

Lesson Learned: Curriculum development is informed by a dynamic relationship among coherent, diverse research and evaluation strategies.

Unresolved Issue: How does personal development interact with disciplinary outcomes? What form does personal and professional integration take?

Studies of professional abilities built three models for each of three majors: nursing, management and education. These have been useful in informing curriculum, and have formed a basis for a more generic set of abilities that we are now using to study alumnae abilities. Faculty use these alumnae and professional ability models to evaluate disciplinary outcomes in the major field. Here faculty compare patterns in performance from a series of faculty-designed, capstone assessments across time, to these externally-derived performance models.

Pictures of human potential from cognitive, moral and ego development measures provide another backdrop. Clearly, curriculum development is informed by a dynamic relationship among coherent, diverse research and evaluation strategies. Those that use data from faculty-designed performance assessments are most useful for improving curriculum. Unresolved, and of ongoing interest in how personal maturity interacts with disciplinary outcomes, and what form integration of disciplinary and other abilities take.

Broad Contributions to General Educational Research Methods and Postsecondary Practice

Lesson Learned: Multiple frameworks and methods yield a useful, complex picture of college outcomes.

Unresolved Issue: How achieve long- and short-term benefits simultaneously?

In the previous sections we intended to demonstrate that pictures of human potential informed by college outcomes studies of development, learning and abilities can contribute to a more general understanding of college student and alumna gains. We know more than we did about developmental trajectories, and visiting educators seem as fascinated as we are with these patterns. The ability models have been widely requested by faculty from other institutions, partly because they were developed from outstanding professionals who were not limited to our graduates. To what extent pictures of abilities of Alverno alumnae will be of interest to external audiences is unclear; however, educators building descriptions of abilities -- from critical thinking to self-assessment, may find these descriptions useful because they are derived from performance in personal and professional, public and private domains.

Clearly, no single college outcomes approach or strategy yields the complex picture of human potential that can contribute to educational practice. While the complexity can be overwhelming at times, we have learned that generating both long- and short-term benefits for curriculum development are important; it is best if both kinds are occurring simultaneously. Yet this has been difficult to achieve.

Our longitudinal analysis of change strategies were helpful for immediate curriculum evaluation early on when we were collecting data on current students, and less helpful for that purpose as we conduct studies of alumnae. Yet now we are realizing the developmental trajectories that are of interest to our faculty. Now we have patterns over the 10 year period a faculty member feels responsible for: a student's college years and how she turns out about five years later.

These broad patterns are no substitute for studies of current students in the major field that illuminate individual trajectories in the development of disciplinary abilities, and give important information on how to refine curriculum. Yet, we have found that current student outcomes may be difficult to interpret without a backdrop of information about alumnae abilities five years out, and abilities of outstanding professionals who are not our graduates. Faculty expectations of students are the product of many sources of information. Our research and evaluation office provides a broad picture against which faculty can review their day-to-day observations from student performance on faculty-designed performance assessments.

Lesson Learned: An institution's educational frameworks shape a conceptual base for assessment.

Unresolved Issue: How will different conceptual bases for assessment impact college outcomes studies?

Simultaneous internal and external benefits accrue from coherent, diverse multiple approaches and strategies. Educational frameworks inform question-asking; discipline-based theories inform interpretation of findings. An educational institution's practice-based philosophy and principles form a conceptual base for assessment. These are, in turn, informed by external theories and methods as findings from multiple studies converge. College outcomes studies, conducted for purposes of institutional assessment, are likely to reflect differences in institutional purpose, just as they are bounded by setting and sample characteristics. We can look forward to a great diversity in findings, and an enriched picture of human potential, where student outcomes are related to institutional purposes and practices.

> Lesson Learned: Contributions to methods can occur when educational purposes and research methods are inseparable.
>
> Unresolved Issue: What institutional processes link purpose and method? How does method change as a result?
>
> Lesson Learned: Contextually valid findings contribute to general theory and practice when they link practice-based frameworks with discipline-based theory in a dynamic setting.
>
> Unresolved Issue: What are principles of institutional assessment that is interactive, inter-disciplinary, integrative, and intends simultaneous internal and external contributions?

In a setting that employs educational framework-driven institutional assessment, purpose and method are inseparable. Methods bend to purpose. This can result in changes in method or suggest alternative ones. We begin to question the philosophy and values underlying methods as a result. For example, how do we define "validity" in such a setting, where a dynamic interplay between research and practice is a goal? Who asks the questions becomes as important as how inquiry proceeds. Who can use the information is as essential as the soundness of the interpretation. The findings that result, tested in a variety of ways, contribute because they link practice-based frameworks with discipline-based theory in the kind of dynamic setting that is characteristic wherever teaching and learning is a major goal.

We have learned to think of our research and evaluation activities as reflecting "applied" and "action" research approaches that are problem-driven and practice-based. However, the dynamic character of our work in this setting suggests other characteristics: "interactive," "interdisciplinary," and "integrative." A combination of these descriptors defines institutional assessment for us. But we struggle to create the processes that engage all parties of interest and that will achieve this ideal. A coherent set of principles of educational framework-driven institutional assessment as we practice it is emerging from this experience. The effort can be overwhelming at times, as we confront the diversity of perspective inherent in a liberal arts faculty and built into our research and evaluation team.

> Lesson Learned: Interdisciplinary research teams apply criteria from various theories and methods, for various purposes. This creates paradoxes.

Unresolved Issue: Which criteria apply? How will these shape institutional assessment?

Working with multiple purposes, designs, instruments and methods may seem like the researcher's dream -- generating results that can be triangulated on each other and validated more immediately through practice. This diversity can often skew us off into a lack of focus, and draw attention away from the primary purposes for the research. Balance is provided by interactive processes that enable our research and evaluation team to confront the immediate and long-range goals of a faculty every step of the way.

This diversity generates conflict often as does the diversity built into the team via graduate training from several institutions, from several disciplines. Gone are the days when one could bury one's self in an independent research program, work alone, and come out periodically for peer critique or the weekly graduate seminar. Instead, one works with other team members and faculty daily on projects within and outside one's immediate expertise.

Researchers new to our team quickly let go of lingering assumptions of this liberal arts college as a quiet place where a common purpose results in "group-think." Rocky discussions result from diverse theoretical and method frameworks. Conversations can erupt as the philosophical and value bases of different perspectives move against each other. A deep and sustained regard for diverse perspectives, and for each other, contribute to constructive interaction.

We have found that the conflict such collaboration generates often benefits external audiences. Individuals from different disciplines bring to bear the questions from "outside" that challenge the deeply held beliefs of another. These conflicts cause stalemates or get over personalized at times. The immediate needs of a faculty provide an incentive to quickly get to the heart of an issue, decide how the conflict will change approaches and interpretations, separate the wheat from the chaff, and move on to the next set of issues.

Conflict is constructive when the team can make progress toward meeting its goals and can decipher which criteria are being applied during critique and argument. There are many dilemmas or challenges that we face if we are to meet the criteria for studies that meet internal and external contributions simultaneously.

For example, utilization and generalizability criteria are often at odds in meeting both internal and external purposes. This is not the only paradox. Meeting the criterion of coherence among educational frameworks and purposes, and research and evaluation approaches and strategies, and at the same time building in diversity of theoretical frameworks, methods and measures generates paradox. Nevertheless, our educational frameworks, which flow from liberal arts principles and multiplicity of perspective within a coherent community of learning, remains an ideal. So we continue to work with coherent, diverse approaches and strategies for research and evaluation.

Which Criteria Apply to College Outcomes Studies Conducted for the Purposes of Institutional Assessment?

Implied in these lessons learned and unresolved issues is a set of goals and standards. What should we expect of ourselves? Should an institution meet standards of institutional scholarship comparable to the standards it sets for individual faculty scholarship? Are the standards similar? What are the responsibilities of institutional scholarship? Where and how is an institution expected to contribute to the field of higher education? Only as an example or case study? Merely as a source of practice-based theory and method? Or can an institution be considered a contributor to general theory and method?

What scientific criteria should be applied to educational research, evaluation and measurement methods that are used in this new kind of application? What is the potential for contributing results to discipline-based theory and method building?

So then, which criteria apply (refer to last column in Figure 1a)? Existing criteria from educational research, evaluation, measurement, and institutional research are sources. Because higher education assessment has created a new context for applying criteria, it may be premature to assume which criteria apply, and how and in what kinds of settings "good" assessment will accrue as the result. The exercise of examining which criteria apply by looking at current college outcomes studies in a variety of institutions can be helpful. We do not want impossible standards to overwhelm initial efforts to design assessment, or to propose criteria too far in advance of our collective experience. But we feel that this ongoing exercise is important to the ultimate goals of institutional assessment as an emerging field (Mentkowski, 1989).

We highlight two combinations of criteria for higher education assessment as those that have provided the most challenge. This is not because any one criterion, on its own, is intractable. Rather, it is this particular combination in college outcomes studies that creates challenges. Paradoxes are highlighted when an institution's mission calls for both internal and external contributions.

We invest in defining criteria that sometimes are in conflict, because the criteria we and others use for critique determine whether that critique can be constructive. For example:

a) are results usable and generalizable?

We have just presented examples which deal with usefulness and application of findings for both internal and external purposes; sometimes utilization and generalizability criteria conflict (Mentkowski, 1989). Let us look at a second combination, that of coherence and diversity (Mentkowski, 1990).

b) are designs, purposes and methods coherent, and do they also provide for diverse and multiple frameworks and perspectives?

The apparent paradox is between the coherence and diversity that is inherent in a rethinking around the purposes, functions and outcomes of undergraduate education. This reconceptualization seems to be initiated both inside (Study Group on the Conditions of Excellence in American Higher Education, 1984) and outside higher education by society's primary beneficiaries (Ewell, 1990).

These developments include efforts toward (Mentkowski, 1990):

- o connecting curricular components in the face of a growing diversity of courses and majors;
- o integrating educators' experience with their disciplinary expertise; and
- o promoting interdisciplinary approaches in assessment design.

Implications for institutional assessment include developing approaches that reflect concerns for both coherence and diversity. Some coherence in curriculum -- via sequenced courses or a more coherent design like Alverno's -- calls for symbiotic educational frameworks and assessment methods. This is balanced by diversity of perspective inherent in the liberal arts and in a multidisciplinary faculty and staff who employ various theoretical frameworks.

Degree of curricular coherence is an important factor when the goal is to evaluate curriculum effects. Are there, at best, identifiable curricular principles in the minds of the students; is there at least, a rationale for learning?

Students may experience the curriculum quite differently. To what degree are perceptions related to actual involvement? Can we relate outcomes to the curriculum? We share Astin's (1991) view that one test of a curriculum means demonstrating causal relationships between curriculum and student learning outcomes.

This concern for degree of curricular coherence is paralleled by equal concerns for graduating students whose abilities are demonstrated in unique, creative ways. Curriculum has another goal, to maximize individual differences. What kinds of designs will enable distinctive student outcomes to emerge, with the richness of intra-individual patterns intact?

Two other combinations of criteria provide additional challenges, and are raised implicitly in the examples presented in this paper. These are:

c) is measurement valid and reliable?

d) are methods feasible and rigorous?

On the last point, Terenzini (1989a) argues that "whether one is dealing with design, measurement or analytical issues, it will be well to remember that campus-based assessment programs are intended to gather information for instructional, programmatic and institutional improvement, not for journal publication" (p. 661). Our own view is that this is traditionally the case, but that an institution with a mission, for example, to develop human potential would be expected to contribute to a more general picture of human potential, and that the information collected as part of the educational research component of its institutional scholarship efforts would be publishable.

Terenzini goes on to say that "methodological standards for research publishable in scholarly and professional journals can probably be relaxed in the interests of institutional utility and advancement" (1989a, p. 662). What does that mean? That institutional scholarship in the service of improving learning can somehow apply "relaxed" standards or criteria? We believe that institutional scholarship and assessment can serve discipline-based theory and method. We would take the stance here that it is hardly a matter of relaxing standards or being less rigorous. Often it is a matter of realizing what level of analysis one is dealing with, and how systematic the information needs to be to answer a question. We find that one has to meet more kinds of criteria that are often conflicting, and that the difficulty is deciding which criteria apply.

In sum, we meet, choose, combine, and adapt criteria from several educational specialties (e.g., educational research, evaluation, measurement). This means applying criteria that do not work against the characteristics of institutional assessment in this setting -- where findings are expected to have "contextual validity" (Mentkowski & Rogers, 1985; Rogers, 1988). This often means working with methods and instruments that are less well established in the literature, adapting, for particular purposes, instruments and methods for particular purposes which are new combinations of purpose and method, and in some cases, creating new methods.

We expect our symposium discussants to speak to this question:

- To what extent is educational research that is internally driven, by institutionally defined purposes and questions, valid and useful to the educational research community, as a way of addressing larger questions about teaching and learning?

Joan Stark and Jon Wergin will discuss strengths and limitations of the approaches just presented, and identify issues that these and other college outcomes researchers will need to resolve in order to benefit higher education practice more widely. They will also make observations on the potential for contributions to educational research from college outcomes studies, and suggest ways that AERA's Division J can provide both professional critique and opportunities to evolve criteria for higher education assessment.

Appendix A. Description of the Current Population.

Characteristics of the Student Body

Alverno's enrollment -- 2,414 -- has tripled since the beginning of the Longitudinal Study. As a women's college with a program of liberal arts and professional preparation, its enrollment is characterized by a wide range of ages, with many women who are returning to school and also first generation college attenders, and recently a a wider ethnic diversity. In the last decade, the college's population of weekday students more than doubled, with predictable impact on the characteristics of the student body:

> Approximately 24% of Alverno's students are under age 23, compared with 20% in 1981, while the proportion of those over 30 has remained at about 53%. Weekend College students are significantly older, with over 71% over the age of 30.
>
> Minority enrollments have tripled in this period, with their representation increasing from 9% in 1981 to about 19% in 1990.
>
> Of the students reporting a religious preference, 56% are Catholic, 19% Lutheran and 15% other.
>
> In Weekday College, 60% of the women are single-never married; 20% are married. In the Weekend College, 30% are single-never married and 43% married.
>
> As the enrollment has grown, the number of students who reside on campus has also, although not as much as the number of commuters. Resident students have made up 9% of the enrollment for several years. Forty-seven percent of the current students are full-time; the proportion rises to 66% for the Weekday College and drops to 30% for the Weekend College. In the Weekday College, over 50% of the majors are in three program areas: Education (29%), Business and Management (13%), and Nursing (13%); 27% of the Weekday students are in the departments of Art (9%), Professional Communications (9%), and Psychology (9%). The Weekend College program is based on three majors: Business Management (63%), Professional Communications (30%) and Nursing (7%).

Retention and Graduation Rates. Based on a study of enrollment and graduation over the last 10 years, the college estimates that:

- Over 80% of the students in the first semester of their first year will return for the second semester {NB: Marlene Neises is sending me the report on this but this is the way she described the results to me}
- Approximately 66% of the students graduate within 5-6 years of entry.

Appendix A (continued). Description of the Current Population.

Comparison with National Statistics

Alverno's enrollment shows both similarities and differences in comparison with the national statistics on post secondary students (National Center for Education Statistics, Digest of Education Statistics, 1989).

> The age distribution among Alverno's students is considerably older, although national enrollments among older students have grown. In total, students over 30 years of age rose from 21% of the enrollment to 25.7% between 1975 and 1985. However, among women students, those over 30 represented 22.6% of the total in 1975, but 30.0% in 1985 (compared with over 50% of Alverno's current students).
>
> At the national level, the ethnic diversity of student enrollments has changed considerably in the last decade. For the total of students attending public institutions, minority representation increased from 17.9% in 1976 to 21.2% in 1986. This trend is somewhat lower for the total enrollment in private institutions (15.4% in 1976 to 19.7% in 1986). In this regard, Alverno's population (19%) is more similar to the national total than might be expected from regional characteristics (e.g., minority enrollment across Wisconsin is 6.5% of the post-secondary total).
>
> In 1986, at the national level, Business was the most frequently reported major for undergraduates, representing 17% of the total and 16% of all women undergraduates (13% of Alverno's current enrollment). Business and Management represented 24% of all bachelor degrees awarded (22% of those awarded to women); Education represented 9% of total (13% for women); Nursing equaled 3% of total (6% for women).
>
> Recognizing that methods for computing graduation rates vary, the most comparable statistic, in terms of Alverno's documentation, comes from the Department of Education High School and Beyond survey. Based on the responses of a sample of 1980 high school seniors who entered four-year college programs, 46% of those in public institutions and 55% of those in private institutions had received their degrees by 1986. While Alverno's current graduation rate is somewhat higher (66%), it includes some transfer students with prior education.

Appendix B. Description of the Longitudinal Sample.

The domain for the longitudinal sample was composed of all women entering the college in the years 1976 and 1978. As discussed below, the rules for eligibility and the rates of participation result in certain changes in the sample across the assessment periods. Approximately 350 women were stable members of the sample, with demographic characteristics distributed as follows:

- 40% were traditional age students -- that is, entering college at 17-19 years of age; 30% were over 30 years of age at entry.
- They were 94% white and 6% black.
- Among those reporting a religious background, 63% were Catholic.
- 31% were married at the time of entry; 58% were single, having never married, and 12% were divorced, separated or widowed.
- 25% came from families where the parents had less than a high school education; 12% had mothers who had earned college degrees and 16% had fathers with college degrees.
- 35% reported that their mothers had no employment or careers outside the home and only 15% reported that their mothers had managerial or professional positions compared with 27% whose fathers held managerial or professional positions.

In terms of educational background:

- 24% had high school grade point averages lower than 2.5 and, for 16%, they were higher than 3.5.
- Nearly half (49%) entered with no prior college, while 32% transferred with over one semester (i.e., more than 15 credits).

During their time at Alverno:

- Over 75% were full time students.
- Only about 17% lived on campus.
- 43% majored in Nursing, 31% in Business Management, 7% in Education, 3% in Communications.
- Of the 351 students who entered at Time 1 without prior college, 146 -- 42% -- graduated from Alverno within six years. Of the total entering students, 46% graduated within six years.

Appendix B (continued). Description of the Longitudinal Sample.

The sample is divided into three cohorts, as described above:

- 25% from the Weekday students entering in 1976.
- 32% from the Weekday students entering in 1977.
- 43% from the Weekend students entering in 1977.

Distinctions among these cohorts involve age and prior education:

- Weekend College students tended to be older; they were more likely to have been married and have children.
- Weekend College students and older students in all cohorts were more likely to have had some prior college but also to have had lower high school GPA's.

Representativeness of the Longitudinal Sample

Because additional data were collected from the participants in the Longitudinal Study, some comparisons are not possible between the sample and the current enrollment. However, in terms of general demographics, there are several differences:

The age distribution in the sample was somewhat younger: 30% had entered after the age of 30 while over 50% of the current enrollment is over age 30.

There were fewer minorities -- 6% compared to 19% today.

They were slightly more Catholic -- 63% compared to 56% today.

Approximately 30% of the total students in both the sample and the current enrollment attended college while married and the trends among the Weekday/Weekend and Full-time/Part-time students are similar for both groups.

The distribution of selected majors for the sample differs considerably, with a much heavier emphasis on Nursing and much less on Education. The sample's distribution reflects the prevailing choice of majors at the college at the time these students entered. For example, in 1977, Nursing represented 53% of the Weekday College majors and 28% of the Weekend; Business and Management represented 4% of the Weekday and 48% of the Weekend; Education was 15% of the Weekday and Professional Communications was 25% of the Weekend.

Full time and resident students were more frequent in the sample -- 75% and 17%, respectively -- than in the current enrollment -- 47% and 9%, respectively. These figures also seem to reflect general trends in the college's attendance patterns.

Appendix B (continued). Description of the Longitudinal Sample.

In addition, a substantially larger percentage are currently staying in the program and graduating within a six-year period.

These distinctions become important considerations as the data are analyzed and inferences made regarding the current population.

Eligibility and Participation

The rules of eligibility were designed to increase the study's capacity to monitor individual changes in relation to learning experiences at Alverno.

1. The participants were required to be on campus during the first three assessment periods.

2. They had to have participated at the Time 1 assessment.

3. For the Time 4 assessment -- five years after college -- they had to have participated in at least two of the first three assessments (i.e., 1 and 2, 1 and 3, or 1, 2 and 3).

Because of the first rule, the eligible sample dropped considerably between the Time 1 and Time 2 assessments. At the Time 1 assessment, conducted during the campus orientation for new students, 706 students were eligible from the 1976 and 1977 cohorts combined. In the two years between the assessment periods, 313 students left campus:

> 142 left the program in the first semester for their respective cohorts (NB: In particular, 1976 was an anomalous year for the college, and most of this group of leaders was from the 1976 cohort)
>
> 27 graduated in the two years between the first two assessment periods
>
> 144 transferred or left the program after attending for at least one semester

Between the second and third assessment periods (i.e., about two years for both cohorts), an additional 66 women graduated and 68 transferred or otherwise left campus.

Therefore, while sample attrition was large between Times 1 and 2, the eligible sample remained at about 300 for the remaining three assessment periods.

Participation ranged from 97.0% to 85.8% at each of the times of assessment, averaging 90.2% overall.

Appendix C: Developing Perspectives on the Role of Criteria for Student Understanding of Independent Learning and Self-Assessment.

WHAT VALUE AND BENEFIT DO ASSESSMENT CRITERIA HAVE FOR STUDENTS?

CRITERIA MAKE INDEPENDENT LEARNING POSSIBLE	CRITERIA MAKE SELF-ASSESSMENT POSSIBLE
... from content to abilities ... from vague to explicit to flexible interpretation ... from external to internal self-assessment	... from grades to criteria ... from quantity to quality ... from opinion to evidence
BEGINNING STUDENT	
• Sees learning objectives as vague directions for what to learn • Finds explicit directions too picky	• Sees assessor judgments as arbitrary and vague and dependent on factors beyond own and assessor's control • Finds explicit assessment criteria too picky
• Sees learning objectives as directions for how much content to learn	• Sees assessor judgments as based on standards for how much to learn • Sees number or letter grades as the standards for how close you are to learning enough of the right answers
• Sees competences or abilities as directions for what to do • Asks for explicit directions for what to do to perform, to get validated, or to "pass"	• Sees criteria as feedback on strengths and weaknesses but as vague with little meaning for "passing"
	• Sees that assessor judgments are based on criteria, but finds interpretation of criteria arbitrary and vague and dependent on personal opinion of the assessor and self • Often doesn't understand why validated or not
	• Sees criteria expressed as percent of correct response • Worries about motivation to achieve where can pass by just getting by

Appendix C (continued): Developing Perspectives on the Role of Criteria for Student Understanding of Independent Learning and Self-Assessment.

DEVELOPING STUDENT

- Sees that criteria given ahead of time tell you what to learn and what to do
- Asks for explicit learning objectives and criteria
- Sees abilities as steps in a process that you use in school and personal life
- Sees learning as a process (you learn how to learn and it doesn't disappear afterwards)

- Sees criteria as providing a picture of the ability to perform

- Sees that feedback on strengths and weaknesses provides explicit information on progress and success
- Sees criteria as a framework for feedback and self-assessment
- Asks for explicit criteria
- Motivated to achieve by explicit criteria
- Rejects grades as a source of information on progress and success

- Sees criteria for assessment as more flexible and ambiguous, as more open to interpretation

ADVANCED STUDENT

- Sees criteria as one part of a process for learning and assessment
- Sees abilities as frameworks for performing and criteria as a picture of the ability for performing and for self-assessment

- Sees criteria as a cognitive framework for learning, that enable transfer of learning

- Sees criteria as being met in more ways than one, and uses in a flexible way to guide independent learning

- Sees criteria as internalized and uses for self-assessment

- Creates own criteria

0584

This handout accompanies a slide-tape of student examples illustrating this framework of student perspectives. The Assessment Committee drew the framework from research on Alverno College students completed by the College's Office of Research and Evaluation.

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Appendix D: Alverno Students' Developing Perspectives on "Self-Assessment," "Using Feedback," and "Commitment to Improvement" that Lead to Taking Responsibility for Learning and Using Different Ways of Learning.

	Self-Assessment	Using Feedback	Commitment to Improvement
BEGINNING STUDENT	• Makes judgments on her own behavior when someone else points out concrete evidence to her • Recognizes that her attitudes affect her work • Recognizes contradictory evaluations of her work • Expects the teacher to take the initiative in recognizing her problems and approaching her about them • Responds to divergent values with self-assessment insights	• At this point, experiences evaluation of her performance as general affirmation or rejection of herself • Her emotional response to evaluation, as of yet, interferes with insight into her performance • Can connect feedback received to subsequent classroom experience	• Knows she should improve, wants to improve; tries to improve in quality ways • Recognizes negative attitudes; expresses willingness to change
DEVELOPING STUDENT	• Senses when her own performance in a given situation is essentially competent or incompetent • Aware that the learning process requires a change in approach to learning • Knows her strengths • Reflects on a given performance as representative of a pattern in her own behavior • Sees criteria as a framework for feedback and self-assessment • Sees criteria as providing a picture of the ability to perform • Compares self to self, rather than just self to others • Achieves sufficient awareness of self to assess her own abilities and how they contribute to a situation (rather than an undifferentiated sense of how "she" contributed)	• Sees the value in separating emotional response to feedback from more objective stance • Sees that feedback on strengths and weaknesses provides explicit information on progress and success • Accepts criticism and suggestions and follows through	• Thinks about how to improve • Builds on her strengths • Sees that criteria given ahead of time tell you what to learn and what to do • Motivated to achieve by explicit criteria • Performs well in structured situations; follows through if there are external demands • Completes assignments in weak areas; is becoming aware of her weaknesses

Appendix D (continued): Alverno Students' Developing Perspectives on "Self-Assessment," "Using Feedback," and "Commitment to Improvement" that Lead to Taking Responsibility for Learning and Using Different Ways of Learning.

Self-Assessment	Using Feedback	Commitment to Improvement
	ADVANCED STUDENT	
• Sees own abilities apart from a given situation • Sees abilities as frameworks for performing and criteria as a picture of the ability for performing and self-assessment • Emphasizes reliance on self-evaluation and self-assessment • Consistently applies self-awareness of self (therefore, has more knowledge of her abilities--acts accordingly) • Shapes her aspirations realistically, commensurate with her abilities • Gives evidence of internalizing standards of self-assessment • Sets personal standards out of her expectations of her professional needs • Shows interest in her ability relative to other professionals	• Seeks out formative evaluation of her work (doesn't just wait for someone else's summative evaluation) • Self-applies formative evaluations of her work • Acts on feedback • Expects feedback that helps her "take charge" • Expects feedback that helps her see patterns and relationships to her performance in other ability areas	• Knows what she needs to do to improve • Consistently makes an effort to improve processes • Uses resources to help her improve processes • Takes initiative to improve her work, finds help when she needs it

The Alverno College Assessment Committee drew this framework from research on Alverno College students completed by the College's Office of Research and Evaluation and the Department of Business and Management.

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Appendix E: Summary of MANOVA Analyses and Associated Statistics.

Table 1

CRITICAL THINKING APPRAISAL
Summary of Between Effects For MANOVA Analysis
Age (3) By
By Time (4)/(Entrance, 2 Years Later, 1 and 1/2 Years Later,
And 5 Years After Alverno

Between Effects Test By Subscale	Age (2,132)
Inferences	F 1
Assumptions	F = 1.28
Deductions	F 1

Table 2

CRITICAL THINKING APPRAISAL
Summary of Univariate Effects For MANOVA Analysis+
Age (3) By
Time (4)/(Entrance, 2 Years Later, 1 and 1/2 Years Later,
And 5 Years After Alverno

	Effects Through Time	
Univariate Tests	Time Effects (1,132)	Age By Time Effects (2,132)
Linear		
Inferences	F = 21.80***	F = 2.62
Assumptions	F = 8.78**	F = 2.05
Deductions	F = 21.78***	F = 3.86a
Quadratic		
Inferences	F = 1.94	F 1
Assumptions	F 1	F = 2.09
Deductions	F = 1.84	F 1
Cubic		
Inferences	F 1	F 1
Assumptions	F = 2.35	F 1
Deductions	F = 1.03	F = 1.12

+ Multivariate F tests are significant for all significant univariate effects reported.
a This effect is not significant at the multivariate level.
** p   .01.   *** p   .001

Appendix E (continued): Summary of MANOVA Analyses and Associated Statistics.

Table 3

CRITICAL THINKING APPRAISAL
Means And Standard Deviations Associated With the Linear Effects of Time (4 levels)

	Time of Administration			
Parameter	At Entrance	Two Years Later	One And A Half Years Later	Five Years After Alverno
		Inferences		
Mean	9.60	10.19	10.37	10.93
Std. Dev.	(3.00)	(3.03)	(3.17)	(3.00)
N	(135)	(135)	(135)	(135)
		Assumptions		
Mean	11.20	11.09	11.60	11.84
Std. Dev.	(2.31)	(2.46)	(2.78)	(2.54)
N	(135)	(135)	(135)	(135)
		Deductions		
Mean	16.17	16.52	17.14	17.60
Std. Dev.	(3.00)	(3.40)	(3.14)	(3.15)
N	(135)	(135)	(135)	(135)

Appendix E (continued): Summary of MANOVA Analyses and Associated Statistics.

Table 4

DEFINING ISSUES TEST: P%
Summary of Between Effects For MANOVA Analysis
Age (3) By
Time (4)/(Entrance, 2 Years Later, 1 and 1/2 Years Later,
And 5 Years After Alverno

Age (2,88)
F = 1.76

Appendix E (continued): Summary of MANOVA Analyses and Associated Statistics.

Table 5

DEFINING ISSUES TEST: P%
Summary of Univariate Effects For MANOVA Analysis+
Age (3) By
Time (4)/(Entrance, 2 Years Later, 1 and 1/2 Years Later,
And 5 Years After Alverno

	Effects Through Time	
Univariate Tests	Time Effects (1,88)	Age By Time Effects (2,88)
Linear	F = 29.18***	F = 1.73
Quadratic	F = 25.15***	F 1
Cubic	F 1	F 1

+ Multivariate or Average F Statistics are significant for all reported Univariate effects.

* p .05. ** p .01. *** p .001

Appendix E (continued): Summary of MANOVA Analyses and Associated Statistics.

Table 6

DEFINING ISSUES TEST: P%
Means and Standard Deviations Associated With the Linear And Quadratic Time (4) Effects

	Time of Administration			
Parameter	At Entrance	Two Years Later	One And A Half Years Later	Five Years After Alverno
Mean	38.79	46.30	49.92	50.38
Std. Dev.	(13.78)	(15.03)	(14.20)	(14.52)
N	(91)	(91)	(91)	(91)

Appendix E (continued): Summary of MANOVA Analyses and Associated Statistics.

Table 7

SENTENCE COMPLETION TEST OF EGO DEVELOPMENT
Summary of Between Effects For MANOVA Analysis
Age (3) By
Time (4)/(Entrance, 2 Years Later, 1 and 1/2 Years Later,
And 5 Years After Alverno

Age (2,148)
F = 1.13

Appendix E (continued): Summary of MANOVA Analyses and Associated Statistics.

Table 8

SENTENCE COMPLETION TEST OF EGO DEVELOPMENT
Summary of Univariate Effects For MANOVA Analysis+
Age (3) By
Time (4)/(Entrance, 2 Years Later, 1 and 1/2 Years Later, And 5 Years After Alverno

	Effects Through Time	
Univariate Tests	Time Effects (1,148)	Age By Time Effects (2,148)
Linear	F = 18.52***	F 1
Quadratic	F = 16.10***	F 1
Cubic	F = 1.67	F 1

+ Multivariate F Statistics are significant for all reported univariate effects.
*** p .001

Appendix E (continued): Summary of MANOVA Analyses and Associated Statistics.

Table 9

SENTENCE COMPLETION TEST OF EGO DEVELOPMENT
Means and Standard Deviations For the Linear and Quadratic Effect of Time (4 levels)

	Time of Administration				
Parameter	At Entrance	Two Years Later	One And A Half Years Later	Five Years After Alverno	N
Mean	5.40	5.31	5.19	5.72	
Std. Dev.	(.85)	(1.06)	(1.01)	(1.01)	
N	(151)	(151)	(151)	(151)	

Appendix E (continued): Summary of MANOVA Analyses and Associated Statistics.

Table 10

SENTENCE COMPLETION TEST OF EGO DEVELOPMENT
Summary of Between Effects For MANOVA Analysis
Age (3) By Mother's Education (2) By
Time (3)/(Entrance, 2 Years Later And Five Years After Alverno

Age (2,210)	Mother's Education (1,210)	Age By Mother's Education (2,210)
F = 1.84	F 1	F = 1.23

Appendix E (continued): Summary of MANOVA Analyses and Associated Statistics.

Table 11

SENTENCE COMPLETION TEST OF EGO DEVELOPMENT
Summary of Univariate Effects For MANOVA Analysis+
Age (3) By Mother's Education (2) By
Time (3)/(Entrance, 2 Years Later And Five Years After Alverno

	Effects Through Time			
Univariate Tests	Time Effects (1,210)	Age By Time Effects (2,210)	Mother's Education By Time Effects (1,210)	Age By Mother's Education By Time Effects (2,210)
Linear	F = 18.48***	F 1	F 1	F = 1.24
Quadratic	F = 28.60***	F 1	F 1	F 1

+ Multivariate F Statistics are significant for all reported univariate effects.

*** p .001

Appendix F: Summary of BEI Generic Abilities.

SOCIO-EMOTIONAL MATURITY

1. Self-Control/Emotional Stamina: Appropriately and effectively controls emotions so that they do not disrupt performance.

2. Ego Strength: Is assertive or perseveres in judgment while withstanding confrontation, disagreement or disapproval. Requires element of risk.

3. Stamina: Perseveres in a potentially or actually stressful situation.

4. Spontaneity/Curiosity: Playful thought, action or expression.

- -

5. Perceptual Objectivity: Demonstrates understanding of more than one perspective.

6. Accurate Self-Assessment: Accurately assesses strengths and weaknesses of own performance to improve or assess own abilities.

7. Reflective Thinking/Valuing: Identifies and reflects upon her own behavior, feelings or beliefs and their consequences. It may include reflecting upon a weakness or mistake, and must result in showing or searching for new insight about self or values.

ENTREPRENEURIAL ABILITIES

8. Proactivity: Taking action that is not scripted by the situation or her role and taking responsibility for the outcome/judgment (not "We").
   A. Initiative
   B. Risk taking initiative

9. Efficiency Orientation: Desire to do something better than a standard of excellence.

10. Efficiency Actions: Actions toward more efficient use of time and resources.

INTELLECTUAL ABILITIES

11. Specialized Knowledge: Use of knowledge that takes more than one year to acquire on the job.

- -

12. Diagnostic Information Seeking: Seeks information in an ambiguous situation.

13. Reflectively Coordinated Practice: Receptive to information value of ongoing events: coordinates ongoing actions, relates unusual observations or uses new information to adjust ongoing actions or plans.

14. Pattern recognition: Comparing a stimulus to an understanding or representation stored in memory.

15. Sees Alternatives: Sees a range of implications, consequences or alternatives, or sees if-then relationships.

16. Hypothetical/Causal Thinking: Shows systematic understanding of possibility and causality.

17. Planning/Systematic Thinking: Takes well-ordered and logical approaches to analyzing problems, organizing work and planning action.

18. Conceptualization: Identifying and seeing the key relationships between key issues while understanding the big picture.

Appendix F (continued): **Summary of BEI Generic Abilities.**

INTERPERSONAL

19. Formal Communication (demonstrated at time of performance): Effectively communicating in formal writing, speaking or planned interactive situation.

- -

20. Concern With Affiliation: Wanting to be with someone else in order to enjoy mutual friendship or company (warmth necessary): Exhibits concern over establishing, maintaining or restoring a warm relationship with another person. This relationship is most adequately described by the word friendship.

21. Affiliative Action: Enjoying, maintaining or establishing companionship for its own sake (warmth necessary).

- -

22. Positive Regard: Showing respect for others: seeing them as capable and worthy.

23. Sensitive to Individual Differences: Being aware of and responsive to individual differences.

24. Accurate Empathy: Effectively reads the moods and feelings of others.

- -

25. Development of Others: Use of a variety of strategies to insure others' development and to improve their performance.

26. Development of Self: Develops own knowledge, skills or capability.

27. Concern With Impact: Exhibits concern about establishing, maintaining or restoring impact, control or influence over other(s) (beyond routine and not avoiding power).

28. Use of Informational/Expert Influence: Uses own credentials for knowledge, access to specific information or construction of rationale to persuade others, including building support for ideas/objectives.

29. Developing Or Using Relational Power: Establishes a warm or inclusive relationship (or uses others' desire for one) in order to influence behavior of others.

- -

30. Use of Socialized/Political Power: Effectively working with others to accomplish tasks.
    A. Political Organizational Action
    B. Dyad/Small Group Action

31. Development of Organizational Power: Develops organizational power through strategic personal contact or shows understanding of how organization is functionally structured.
    A. Develops Organizational Power
    B. Understands Functional Structure

- -

32. Use of Unilateral Power: Gives directions/orders based upon personal authority or rules/procedures to obtain compliant behavior.

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Appendix G: Example of the Coding of Efficiency Actions, Positive Regard and Development of Organizational Power.

SITUATION:
I developed and continue to work with a computerized system that measures the times various nursing activities require, and then totals the times as nurses entered the activities.

When the system actually began to operate within the hospital and staff, who are users of the system from the standpoint of being the ones that have to enter the data, and the system would not be a good system unless staff nurses consistently entered data and believe that they should be accurate with it. And as I recognized that staff nurses respected the system and had confidence in it and said, "This system tells what we are doing," as opposed to the system we had used in the past that had little support of the users, that made me feel that it wasn't just that I thought that we had done a good job. That it really is a good system and made me feel it is a system should be published or it should be broadcast.

Efficiency Actions
(10B2 and 10B3)

As I have been moving along through this project of developing this computerized data collection system, I did keep track of what I did so that I would have a lot of minutes of meetings. I carefully planned meetings so that I always had agendas. I worked with a lot of different groups of people, and so I had a lot of information that I could then look at when I thought about writing an article and submitting it to the international society.

I had encouragement from a nursing administrator and from the head of a technical department who said, "This should be written up. This is an excellent system; let's write it up; let's get it out there." Probably one of the big factors that led to actually doing it would have been the head of the technical department who

Development of
Organizational
Power
(31A1)

Appendix G (continued): Example of the Coding of Efficiency Actions, Positive Regard and Development of Organizational Power.

said that he would be very happy to work with me on it. He has a word processor and did a lot of the mechanics of putting the article together. He would take a lot of what I had and get that into print so that we could start looking at it. That was certainly a big reason for moving ahead with it too.

Development of
Organizational Power
continued
(31A1)

THOUGHT/FELT:
When I began I wanted to tell about the system. By the time I had completed the article, I wanted other people to know what the system was, and that was more important to me. But when I began, I really wanted to tell all the things that I had done.

ACTUALLY DID:
To Get Started With the Publishing, I began by looking at all of the information that I had that led up to the system. And then I did an outline of what I thought others would want to hear from within the context of the information that I had about the system. The article had to be shortened considerably because I began with taking all of the data that related to the various points in the outline and then pared it down from there. I knew it had to be shortened because we had page number constraints.

To Shorten the Article, I started by taking just what, I thought, had to be included. The really pertinent information: that if that was missing it wouldn't make much sense. And I tried to keep in mind that if you can tell what it is you are doing, why you're doing it, what happened when you did it, and what are the results that you see. By this time it was already in pros. I probably had to do three revisions before I had it to the right length. Again, I had help from the head of the technical department with the revision process, but primarily again it was looking at what would be the points that would interest people. I did have to let go of some of what interested me the

Positive Regard

Appendix G (continued): Example of the Coding of Efficiency Actions, Positive Regard and Development of Organizational Power.

most and some of my pet parts that I felt were just absolutely vital to be said. But I did make myself look at it as if I were a hospital administrator. There are people from all areas of health care, a lot of physicians, and I had to consider what would interest them as opposed to what was important for the nursing staff.

Positive Regard
continued
(22B2)

The head of the technical department was very helpful in that he put everything on his word processor and so as I would revise things, he would bring them back to me for further review and revision. And he would again pull back the latest copy of what I thought we should have. Then after I agreed that it was the way I wanted to submit it, he did do the final preparation of putting it onto the big papers that you have to use. He just did editing. I did put him on as co-author because we had worked on the project together. He has since published a paper from his department's standpoint on the same system which he is just using the material that I had developed, and he put me in as a co-author. We had agreed to that.

OUTCOME:
The article that I had submitted to an international society that holds a conference every three years was accepted for publication in the proceedings, and then I was also asked to present the paper. That was very satisfying because I felt that the system that we have in place is really very sophisticated, and I personally have felt that it's probably one of the best ones that I've been able to see anywhere. It made me feel that other people at least felt that it was a good system if they wanted me to come in and present it.

Development of
Organizational Power
(31A1)

When I presented, I had a great deal of positive feedback with people from other countries even commenting to me personally that they felt it was the best presentation of a five day conference. As I thought about that, I really believe that the reason I got that kind of feedback wasn't because of my presentation, but because I did stick to being able to present something that "This is how we did it; this is what it is; this is how we did it; these are the results," whereas many of the presentations were done simply from description of a system as opposed to being able to say "this is what it is; etc."

Note: This write-up was coded for many abilities in addition to efficiency actions, positive regard, and development of organizational power. For the sake of clarity, those codes are not included on this sample.

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